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An Address
ON
DARWIN'S THEORY OF MAN'S DESCENT AS IT STANDS TO-DAY.

DELIVERED TO THE BRITISH ASSOCIATION* BY THE PRESIDENT,

PROFESSOR SIR ARTHUR KEITH, M.D., F.R.S.,
CONSERVATOR OF THE MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

IN tracing the course of events which led up to our present conception of Man's origin, no place could serve as a historical starting point so well as Leeds. In this city was fired the first verbal shot of that long and bitter strife which ended in the overthrow of those who defended the Biblical account of Man's creation and in a victory for Darwin. When the British Association assembled in this city in 1858 Sir Richard Owen, the first anatomist of his age, was its president. In a long address he reviewed the whole realm of Science. During its course he cited evidence which suggested a much earlier date for the appearance of Man on earth than was sanctioned by Biblical records, but poured scorn on the idea that Man was merely a transmuted ape. He declared that the differences between Man and ape were so great that it was necessary to assign mankind to an altogether separate Order in the animal kingdom. As this statement fell from the President's lips there was at least one man in the audience whose spirit of opposition was roused—Thomas Henry Huxley—Owen's young and rising antagonist. I have picked out Huxley because it is necessary, for the development of my theme, that we should give him our attention for a moment. The Leeds meeting passed off amicably, but two years later, in 1860, when this Association met in Oxford, Owen, in the course of a discussion, repeated the statement made at Leeds as to Man's separate position, claiming that the human brain had certain structural features never seen in the brain of anthropoid apes. Huxley's reply was a brief and emphatic denial, with a promise to produce evidence in due course—which was faithfully kept. This opening passage at arms was followed two days later by that spectacular fight in which the Bishop of Oxford, the representative of Owen and of Orthodoxy, left his scalp in Huxley's hands. To make his victory decisive and abiding, Huxley published, early in 1863, *The Evidences of Man's Place in Nature*, a book which settled for all time that Man's rightful position is among the primates, and that as we anatomists weigh evidence, his nearest living kin are the anthropoid apes.

My aim is to make clear the foundations on which rest our present-day conception of Man's origin, but I must turn to another issue, which, though it was merely touched upon by Sir Richard Owen, is of supreme interest to us now. Earlier in that year Sir Charles Lyell and Sir Joseph Hooker left with the Linnean Society what appeared to be an ordinary roll of manuscript, but what in reality was a parcel charged with high explosives, prepared by two very innocent-looking men—Alfred Russel Wallace and Charles Darwin. It must be admitted that these two men were well aware of the deadly nature of its contents, but Owen examined them and came to the conclusion that they were not dangerous; at least, he manifested no sign of alarm in his Presidential Address.

The Transformation of our Outlook on Man's Origin.

I cannot help marvelling over the difference of outlook between my audience and that which Sir Richard Owen had in this city sixty-nine years ago. The vast assemblage which confronted him was convinced, almost without a dissentient, that Man had appeared on earth by a special act of creation; the audience I address, and that larger congregation which the wonders of wireless bring within the reach of my voice, if not convinced Darwinists, are yet prepared to believe, when full proofs are forthcoming, that Man began his career as a humble primate animal, and has reached his present estate by the action and reaction of biological forces which have been and are ever at work within his body and brain.

Darwin's Generalship.

This transformation of outlook on Man's origin is one of the marvels of the nineteenth century, and to see how it was effected we must turn our attention for a little while to the village of Down in the Kentish uplands, and note what Charles Darwin was doing on the very day that Sir Richard Owen was delivering his address. He sat in his study struggling with the first chapter of a new book: but no one foresaw, Owen least of all, that the publication of the completed book, *The Origin of Species*, fifteen months later (1859), was to effect a sweeping revolution in our way of looking at living things and to initiate a new period in human thought—the Darwinian Period—in which we still are. Without knowing it, Darwin was a consummate general. He did not launch his first campaign until he had spent twenty-two years in stocking his arsenal with ample stores of tested and assorted fact. Having won territory with *The Origin of Species*, he set to work to consolidate his gains by the publication in 1868 of another book, *The Variation of Animals and Plants under Domestication*—a great and valuable treasury of biological observation. Having thus established an advanced base, he moved forwards on his final objective—the problem of human beginnings—by the publication of *The Descent of Man* (1871), and that citadel capitulated to him. To make victory doubly certain he issued in the following year—1872—*The Expression of the Emotions in Man and Animals*. Many a soldier of truth had attempted this citadel before Darwin's day, but they failed because they had neither his generalship nor his artillery.

History as Written by Darwin.

Will Darwin's victory endure? Before attempting to answer this question, let us look at what kind of book *The Descent of Man* is. It is a book of history—the history of Man, written in a new way—the way discovered by Charles Darwin. I will illustrate the Darwinian way of writing history. If a history of the modern bicycle had to be written in the orthodox way, we should search dated records until every stage was found which linked the two-wheeled hobby-horse, bestrode by tall-hatted men at the beginning of the nineteenth century, to the modern "jeopardy" which now flashes past us in country lanes. But suppose there were no dated records—only a jumble of antiquated machines stored in the cellar of a museum. We should then have to adopt Darwin's way of writing history. By an exact and systematic comparison of one machine with another we could infer the relationship of one to another and tell the order of their appearance, but as to the date at which each type appeared and the length of time it remained in fashion, we could say very little. It was by adopting this circumstantial method that Darwin succeeded in writing the history of Man. He gathered historical documents from the body and behaviour of Man and compared them with observations made on the body and behaviour of every animal which showed the least resemblance to Man. He studied all that was known in his day of Man's embryological history and noted resemblances and differences in the corresponding histories of other animals. He took into consideration the manner in which the living tissues of Man react to disease, to drugs, and to environment; he had to account for the existence of diverse races of mankind. By a logical analysis of his facts Darwin reconstructed the history of Man.

Darwin's Position has become Impregnable.

Fifty-six years have come and gone since that history was written; an enormous body of new evidence has poured in upon us. We are now able to fill in many pages which Darwin had to leave blank, and we have found it necessary to alter details in his narrative, but the fundamentals of Darwin's outline of Man's history remain unshaken. Nay, so strong has his position become that I am convinced that it never can be shaken.

* The address has been slightly shortened by the omission of a few sentences. (See also page 459.)

The Evidence of Fossil Remains.

I say confidently that Darwin's position has become impregnable because since his death in 1882 we have succeeded in tracing Man by means of his fossil remains and by his stone implements backwards to the very beginning of that period of the earth's history to which the name Pleistocene is given. We thus reach a point in history which is distant from us at least 200,000 years, perhaps three times that amount. Nay, we have gone farther, and traced him into the older and longer period which preceded the Pleistocene—the Pliocene. It was in strata laid down by a stream in Java during the later part of the Pliocene period that Dr. Eugen Dubois found, ten years after Darwin's death, the fossil remains of that remarkable representative of primitive humanity to which he gave the name *Pithecanthropus*, or Ape-man; from Pliocene deposits of East Anglia Mr. Reid Moir has recovered rude stone implements. If Darwin was right, then as we trace Man backwards in the scale of time he should have become more bestial in form—nearer to the ape. That is what we have found. But if we regard *Pithecanthropus* with his small and simple yet human brain as a fair representative of the men of the Pliocene period, then evolution must have proceeded at an unexpectedly rapid rate to culminate to-day in the higher races of mankind.

Man's Descent has not been in a Straight Line.

The evidence of Man's evolution from an ape-like being, obtained from a study of fossil remains, is definite and irrefutable, but the process has been infinitely more complex than was suspected in Darwin's time. Our older and discarded conception of Man's transformation was depicted in a well known diagram which showed a single file of skeletons, the gibbon at one end and Man at the other. In our original simplicity we expected, as we traced Man backwards in time, that we should encounter a graded series of fossil forms which would carry him along a straight path to an anthropoid ancestor. We should not have made this initial mistake if we had remembered that the guide to the world of the past is the world of the present. In our time Man is represented not by one but by many and diverse races—black, brown, yellow, and white; some of these are rapidly expanding, others are as rapidly disappearing. Our searches have shown that in remote times the world was peopled, sparsely it is true, with races showing even a greater diversity than those of to-day, and that even then the same process of replacement was at work. We have to thread our way, not along the links of a chain, but amongst the meshes of a complicated network.

Diversity of Form in Ancient Times.

We committed a still further blunder. Seeing that in our search for Man's ancestry we expected to reach an age when the beings we would have to deal with would be simian rather than human, we ought to have marked the conditions which prevail amongst living anthropoid apes. We ought to have been prepared to find, as we approached a distant point in the geological horizon, that the forms encountered would be as widely different as are the gorilla, chimpanzee, and orang, and confined, as these great anthropoids now are, to limited parts of the earth's surface. That is what we are now realizing; as we go backwards in time we discover that mankind becomes broken up, not into separate races as in the world of to-day, but into numerous and separate species. When we go into a still more remote past they become so unlike that we have to regard them not as belonging to separate species but different genera. It is amongst this welter of extinct fossil forms which strew the ancient world that we have to trace the zigzag line of Man's descent.

Discordant Evolution.

We made another mistake when we set out on the search for Man's ancestry; indeed, some of us are still making it. We expected that Man's evolution would pursue not only an orderly file of stages, but that every part of his body—skull, brain, jaws, teeth, skin, body, arms, and legs—would at each stage become a little less ape-like, a little more Man-like. Our searches have shown us that Man's evolution has not proceeded in this manner. In some extinct races, while one part of the body has moved forwards another part has lagged behind. We now know that, as Darwin sat in his study at Down, there lay hidden at Piltdown, in Sussex, not thirty miles distant from him, sealed up in a bed of gravel, a fossil human skull and jaw. In 1912, thirty years after Darwin's death, Mr. Charles Dawson discovered this skull, and my friend Sir Arthur Smith Woodward described it, and rightly recognized that skull and jaw were parts of the same individual, and that this individual had lived, as was determined by geological and other evidence, in the opening phase of the Pleistocene period. We may confidently presume that this individual was representative of the people who inhabited England at this remote date. The skull, although deeply mineralized and thick-walled, might well have been the rude forerunner of a modern skull, but the lower jaw was so ape-like that some experts denied that it went with the human fossil skull at all, and supposed it to be the lower jaw of some extinct kind of chimpanzee. This mistake would never have been made if those concerned had studied the comparative anatomy of anthropoid apes, for then they would have been prepared to meet with the discordances of evolution. The same irregularity in the progression of parts is evident in the anatomy of *Pithecanthropus*, the oldest and most primitive form of humanity so far discovered. The thigh-bone might easily be that of modern man, the skull-cap that of an ape, but the brain within that cap, as we now know, had passed well beyond an anthropoid status. If merely a lower jaw had been found at Piltdown an ancient Englishman would have been wrongly labelled "Higher anthropoid ape"; if only the thigh-bone of *Pithecanthropus* had come to light in Java, then an ancient Javanese, almost deserving the title of anthropoid, would have passed muster as a man.

Blanks Still Remain in the Geological Record.

Such examples illustrate the difficulties which beset the task of unravelling Man's ancestry, and there are others; there still remain great blanks in the geological record of Man's evolution; as our search proceeds these blanks will be filled in. By the discovery of fossil remains we have followed Man backwards to the close of the Pliocene period, which endured at least for a quarter of a million years, but we have not yet succeeded in tracing him through this period. It is true that we have found fossil teeth in Pliocene deposits which may be those of an ape-like man or of a man-like ape; until we find other parts of their bodies we cannot tell. When we pass into the still older Miocene period—one which was certainly twice as long as the Pliocene—we are in the heyday of anthropoid history. Thanks to the labours of Dr. Guy E. Pilgrim, of the Indian Geological Survey, we know already of a dozen different kinds of great anthropoids which lived in Himalayan jungles during middle and later Miocene times; we know of at least three other kinds of great anthropoid apes which lived in the contemporary jungles of Europe. Unfortunately we have found as yet only the most resistant parts of their bodies—teeth and fragments of jaw. Do some of these fragments represent an ancestor of man? We cannot decide until a lucky chance brings to light a limb-bone or a piece of skull, but no one can compare the teeth of these Miocene anthropoids with those of primitive man, as has been done so thoroughly by Professor William K. Gregory, and escape the conviction that in the dentitions of the extinct anthropoids of the Miocene jungles we have the ancestral forms of human teeth.

Date of Man's Emergence.

It is useless to go to strata still older than the Miocene in search of Man's emergence; in such strata we have found only fossil traces of emerging anthropoids. All the evidence now at our disposal supports the conclusion that Man has arisen, as Lamarck and Darwin suspected, from an anthropoid ape not higher in the zoological scale than a chimpanzee, and that the date at which human and anthropoid lines of descent began to diverge lies near the beginning of the Miocene period. On our modest scale of reckoning, that gives Man the respectable antiquity of about one million years.

Proofs of Our Anthropoid Ancestry.

Our geological search has not produced so far the final and conclusive evidence of Man's anthropoid origin; we have not found as yet the human *imago* emerging from its anthropoid encasement. Why, then, do modern anthropologists share the conviction that there has been an anthropoid stage in our ancestry? They are not blind to the degree of difference which separates Man and ape in structure, in appearance, and in behaviour. I must touch on the sources of this conviction only in a passing manner. Early in the present century Professor G. H. F. Nuttall of Cambridge University discovered a trustworthy and exact method of determining the affinity of one species of animal to another by comparing the reactions of their blood. He found that the blood of Man and that of the great anthropoid apes gave almost the same reaction. Bacteriologists find that the living anthropoid body possesses almost the same susceptibilities to infections, and manifests the same reactions, as does the body of Man. So alike are the brains of Man and anthropoid in their structural organization that surgeons and physiologists transfer experimental observations from the one to the other. When the human embryo establishes itself in the womb it throws out structures of a most complex nature to effect a connexion with the maternal body. We now know that exactly the same elaborate processes occur in the anthropoid womb and in no other. We find the same vestigeal structures—the same "evolutionary postmarks"—in the bodies of Man and anthropoid. The anthropoid mother fondles, nurses, and suckles her young in the human manner. This is but a tithe of the striking and intimate points in which Man resembles the anthropoid ape. In what other way can such a myriad of coincidences be explained except by presuming a common ancestry for both?

The Evolution of Man's Brain.

The crucial chapters in Darwin's *Descent of Man* are those in which he seeks to give an historical account of the rise of Man's brain and of the varied functions it subserves. Darwin was not a professional anatomist, and therefore accepted Huxley's statement that there was no structure in the human brain that was not already present in that of the anthropoid. In Huxley's opinion the human brain was but a richly annotated edition of the simpler and older anthropoid book, and that this edition, in turn, was but the expanded issue of the still older original primate publication. Since this statement was made thousands of anatomists and physiologists have studied and compared the brain of Man and ape; only a few months ago Professor G. Elliot Smith summarized the result of this intensive inquiry as follows:

> "No structure found in the brain of an ape is lacking in the human brain, and, on the other hand, the human brain reveals no formation *of any sort* that is not present in the brain of the gorilla or chimpanzee. . . . The only distinctive feature of the human brain is a quantitative one."

Though the difference is only quantitative its importance cannot be exaggerated. In the anthropoid brain are to be recognized all those parts which have become so enormous in the human brain. It is just these expansions which have given Man his powers of feeling, understanding, acting, speaking, and learning.

The Evidence of Psychology.

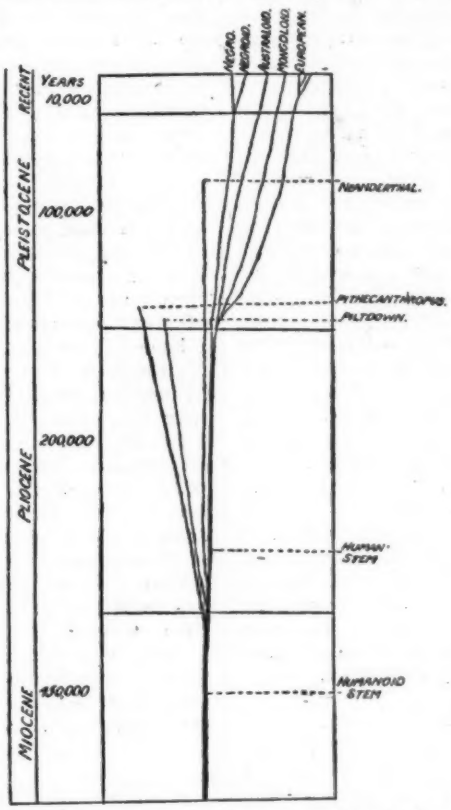
Darwin himself approached this problem not as an anatomist but as a psychologist, and after many years of painstaking and exact observation convinced himself that, immeasurable as are the differences between the mentality of Man and ape, they are of degree, not of kind. Prolonged researches made by modern psychologists have verified and extended Darwin's conclusions. No matter what line of evidence we select to follow—evidence gathered by anatomists, by embryologists, by physiologists, or by psychologists—we reach the conviction that Man's brain has been evolved from that of an anthropoid ape and that in the process no new structure has been introduced and no new or strange faculty interpolated.

Unexplained Problems.

But finality is not in sight; our inquiries are but begun. Will the day ever come when we can explain why the brain of man has made such great progress while that of his cousin the gorilla has fallen so far behind? Can we explain why inherited ability falls to one family and not to another; or why, in the matter of cerebral endowment, one race of mankind has fared so much better than another? We have as yet no explanation to offer, but an observation made twenty years ago by one on whom Nature has showered great gifts—a former President of this Association and the doyen of British zoologists, Sir E. Ray Lankester—deserves quotation in this connexion:

> "The leading feature in the development and separation of Man from other animals is undoubtedly the relative enormous size of the brain in Man and the corresponding increase in its activities and capacity. It is a striking fact that it was not in the ancestors of Man alone that this increase in the size of the brain took place at this same period—the Miocene. Other great mammals of the early Tertiary period were in the same case."

When primates made their first appearance in the geological record they were, one and all, small brained.



Rough diagram to illustrate the relation in time of the several geological periods mentioned by Sir Arthur Keith. More precise delineations will be found in the frontispieces of Volumes I and II of his *Antiquity of Man* (London: Williams and Norgate, 1925).

Darwin's Conception of Evolution Illustrated.

I have spoken of Darwin as an historian. To describe events and to give the order of their occurrence is the easier part of an historian's task; his real difficulties begin when he seeks to interpret the happenings of history and detect the causes which produced them. Up to this point I have been considering only the materials for Man's history, and placing them, so far as our scanty information allows, in the order of their sequence, but now we have to seek out the biological processes and controlling influences which have shaped the evolutionary histories of Man and ape. It will repay us to use the evolution of new types of motor cars as an illustration. In the evolution of motor vehicles Darwin's law of Selection has prevailed; there has been severe competition, and the types which have answered best to the needs and tastes of the public have survived. The public has selected on two grounds—first for utility, thus illustrating Darwin's law of Natural Selection—and secondly, because of appearance's sake; for, as most people know, a new car has to satisfy, not only the utilitarian demands of its prospective master, but also the aesthetic tastes of its prospective mistress, therein illustrating Darwin's second law—the law of Sexual Selection. The public has selected types of car, but it has had no direct hand in designing and producing modifications and improvements which have appeared year after year. To understand how such modifications are produced the inquirer must enter a factory, and not only watch artisans shaping and fitting parts together, but also visit the designer's office. In this way he will obtain a glimpse of the evolution of motor cars. If we are to understand the machinery which underlies the evolution of Man and of ape, we have to enter the "factories" where they are

produced—look within the womb and see the ovum being transformed into an embryo, the embryo into a foetus, and the foetus into a babe. After birth we may note infancy passing into childhood, childhood into adolescence, adolescence into maturity, and maturity into old age. Merely to register the stages of change is not enough; to understand the controlling machinery we have to search out and uncover the processes which are at work within developing and growing things and the influences which co-ordinate and control all the processes of development and of growth. When we have discovered the machinery of development and of growth we shall also know the machinery of Evolution, for they are the same.

If the simile I have used would have sounded strange in Darwin's ear, the underlying meaning would have been familiar to him. Over and over again he declared that he did not know how "variations" were produced, favourable or otherwise; nor could he have known, for in his time hormones were undreamt of and experimental embryology scarcely born. With these recent discoveries new vistas opened for students of Evolution. When we compare the evolutionary machinery in a motor factory with that which regulates the development of an embryo within the womb, we realize how different the two processes are. Let us imagine for a moment what changes would be necessary were we to introduce "embryological processes" into a car factory. We have to conceive a workshop teeming with clustering swarms of microscopic artisans, mere specks of living matter. As we pass along we note that every part of a car is in process of manufacture, each part being the business of a particular brigade of microscopic workmen. There is no apprenticeship in this factory; every employee is born, just as a hive-bee is, with his skill already fully developed. No plans or patterns are supplied; every workman has the needed design in his head from birth. There is neither manager, overseer, nor foreman to direct and co-ordinate the activities of the vast artisan armies. And yet if parts are to fit when assembled, if pinions are to mesh and engines run smoothly, there must be some method of co-ordination. It has to be a method plastic enough to permit difficulties to be overcome and the introduction of advantageous modifications when these are needed. A modern works manager would be hard put to it were he asked to devise an automatic system of control for such a factory, yet it is just such a system that we are now obtaining glimpses of in Nature's living workshops.

The Machinery of Development and Growth.

I have employed a crude simile to give an inkling of what happens in that factory where the most complicated of machines are forged—the human body and brain. The fertilized ovum divides and redivides; one brood of microscopic living units succeeds another, and as each is produced the units group themselves to form the "parts" of an embryo. Each "part" is a living society; the embryo is a huge congeries of interdependent societies. How are their respective needs regulated, their freedoms protected, and their manœuvres timed? Experimental embryologists have begun to explore and discover the machinery of regulation. We know enough to realize that it will take many generations of investigators to work over the great and new field which is thus opening. When this is done we shall be in a better position to discuss the cause of "variation" and the machinery of Evolution.

If we know only a little concerning the system of government which prevails in the developing embryo we can claim that the system which prevails in the growing body, as it passes from infancy to maturity, is becoming better known every year. The influence of the sex glands on the growth of the body has been known since ancient times; their removal in youth leads to a transformation in the growth of every part of the body, altering at the same time the reactions and temperament of the brain. In more recent years it has been observed that characteristic alterations in the appearance and constitution of the human body can be produced by the action of other glands—the pituitary, thyroid, parathyroid, and adrenals. Under the disorderly action of one or other of these glands individuals may, in the course of a few years, become so changed in appearance that the differences between them and their fellows become as great as, or even greater than, those which separate one race of mankind from another. The physical characters which are thus altered are just those which mark one race off from another. How such effects are produced we did not know until 1904, when the late Professor E. H. Starling, a leader amongst the great physiologists of our time, laid bare an ancient and fundamental law in the living animal body—his law of hormones. I have pictured the body of a growing child as an immense society made up of myriads of microscopic living units, ever increasing in numbers. One of the ways—probably the oldest and most important way—by which the activities of the communities of the body are co-ordinated and regulated is by the postal system discovered by Starling, wherein the missives are hormones—chemical substances in ultra-microscopic amounts, dispatched from one community to another in the circulating blood. Clearly the discovery of this ancient and intricate system opens up fresh vistas to the student of Man's evolution. How Darwin would have welcomed this discovery! It would have given him a rational explanation to so many of his unsolved puzzles, including that of "correlated variations." Nor can I in this connexion forbear to mention the name of one who presided so ably over the affairs of this Association fifteen years ago—Sir E. Sharpey-Schafer. He was the pioneer who opened up this field of investigation and has done more than anyone to place our knowledge of the nature and action of the glands of internal secretion on a precise basis of experimental observation. With such sources of knowledge being ever extended and others of great importance, such as the study of heredity, which I have left unmentioned, we are justified in the hope that Man will be able in due time not only to write his own history but to explain how and why events took the course they did.

I have attempted to answer a question of momentous importance—What is Man's origin? Was Darwin right when he said that Man, under the action of biological forces which can be observed and measured, has been raised from a place amongst anthropoid apes to that which he now occupies? The answer is Yes! and in returning this verdict I speak but as foreman of the jury—a jury which has been empanelled from men who have devoted a lifetime to weighing the evidence. To the best of my ability I have avoided, in stating the evidence on which our verdict was found, the role of special pleader, being content to follow Darwin's own example—Let the Truth speak for itself.

DISCUSSION ON THE HYGIENE OF MENSTRUATION IN ADOLESCENTS.*

I.—DEVELOPMENTAL CHANGES DURING ADOLESCENCE.

BY

R. W. JOHNSTONE, C.B.E., M.D., F.R.C.S.ED.,
Professor of Midwifery and the Diseases of Women, University of Edinburgh.

I WELCOME the opportunity of opening this discussion on the hygiene of menstruation in adolescents. The subject is a most important one and, as it is a matter which falls peculiarly within the province of the confidential family physician, there could be no more suitable gathering than this in which to discuss it. Few matters in regard to feminine hygiene have a more profoundly far-reaching importance. The wise management of a girl's life at the period of adolescence gives the functions of her reproductive organs a good start, and if these behave normally to begin with there is the more likelihood that they will continue to do so. The converse is equally but not more true, although it is much more frequently brought to our

* Report of a discussion in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association at Edinburgh. Dr. J. Haig Ferguson, President of the Section, was in the chair.

professional notice—namely, that mismanagement of a girl's health at this time only too often spells suffering, unhappiness, and disappointment, which may throw a shadow over her whole subsequent life.

For our present purpose the period of adolescence, which is variously defined by different writers, may be taken to extend from the time when the changes of puberty begin to manifest themselves to the time when the function of menstruation has become regularly established, the secondary sex characters have become fully developed, and the girl has practically reached her full physical stature. Generally speaking, this phase extends in the girls of our own race from about 12½ to 17 or 18 years, varying within limits in each individual. The changes occurring in the anatomy and physiology of the body during these years are the most momentous of the whole lifetime. The almost asexual child begins to develop definitely and rapidly towards more and more complete femininity. The anatomical metamorphosis from the angular, gawky tomboy to the maiden with her soft, rounded curves and graceful dignity of movement is familiar to all. The psychological change is no less familiar with its characteristic increase in modesty and reserve, and a tendency to romanticism. A whole new world of thought and emotion is opening up before the girl's mind during this period, and if her emotional nature is apt to be a little unstable at this time it is scarcely to be wondered at. The underlying physiological changes are even more profound, and of them the most obvious and arresting is the beginning of the menstrual function.

It is no part of my intention to examine these changes in detail, but it is essential to emphasize that the development from bud to flower takes time, and that even the regular establishment of menstruation does not of itself indicate anything like complete physiological or anatomical maturity. The bony pelvis, for example, probably does not reach its full size and width until about 22 or 23 years, when the young woman may be said to have reached the age of nubility, and can with safety become a mother. Long before this, however, the external and internal organs of generation have acquired their adult characters and functions, and maternity is possible. The uterus, tubes, and vagina have lost their infantile size and shape, and developed to more mature proportions. The ovaries have likewise increased in size, and the regular ripening of follicles, the discharge of ova, and the subsequent development of corpora lutea have begun. Along with these changes there are other more abstruse physiological changes, such as alterations in the blood and lymph balance, and in the biochemistry of the body, which I am not competent to discuss. But the great point which we require to keep ever before us is that the girl's entire organism is concerned in the changes of puberty and adolescence. The old belief that the development of the secondary sex characters was due wholly to the internal secretions of the ovaries has had to be modified as a result of modern research, and we now have reason to believe that all the glands of internal secretion are concerned in the process. It is on account of "the totality of her internal secretions"—to use Blair Bell's words—that a woman becomes what she is, and even this dictum we must now preface with the impetus towards femininity given at the moment of conception by the fertilization of the ovum by a particular variety of spermatozoon. The periodic premenstrual enlargement of the thyroid is perhaps the only one of the changes in the endocrine glands which is easily observable, but the very fact that the changes in the other ductless glands are going on behind the scenes, as it were, must put us on our guard against any failure to take them into account. It is obvious, therefore, that puberty and early adolescence must form a critical period when unhygienic methods of living may easily produce disastrous results affecting both body and mind.

It is not necessary to enter with any fullness upon the complex subject of the actual cause of menstruation. Suffice it to say that the best supported modern view—admittedly incomplete in many details—indicates that it is due to an internal secretion of the ovary, probably of the corpus luteum; but that the ovary cannot function normally unless its functions are harmoniously related to those of the other members of the endocrine system, particularly the thyroid and pituitary glands. Ovulation, occurring about a fortnight after the beginning of a menstrual period, is followed by the preparation of the endometrium for the nidation of a fertilized ovum. If this is not forthcoming, the corpus luteum begins to degenerate, and the menstrual decidua, as the endometrium at this stage may be described, disintegrates, with consequent haemorrhage into the uterine cavity and so to the exterior. Regeneration of the uterine mucosa then occurs, and in due course the whole of this process is regularly repeated, until ultimately fertilization of an ovum occurs, when the full sex cycle accomplishes itself in the phenomena of pregnancy, parturition, the puerperium, and the period of lactation.

But to return to the phase of adolescence, there is no doubt that, although the development of the reproductive organs and the commencement of their functioning are accompanied by the manifold physiological changes to which I have referred, yet the reproductive organs themselves are the star performers in the drama of puberty, and the parts taken by the other organs are subordinated to the full working out of their destiny. Despite any arguments to the contrary, reproduction is the greatest function of womanhood, and certainly it is the only one in which Mother Nature takes any special interest. She is almost obsessed with the one idea—reproduction of the species; she has no interest in intellectual developments, and indeed where these are extreme she not infrequently makes the individual pay dearly for them. In other words, the reproductive organs during this phase of life call for a specially good supply of healthy blood and nerve energy, and if these are diverted to any great extent, either to the muscular system or to the intellectual centres, the proper development and early functioning of the reproductive organs are liable to suffer. This is, I believe, in its simplest terms the explanation of many of the disorders of menstruation and the reproductive functions which we meet with—amenorrhoea, menorrhagia, dysmenorrhoea, and, in later life, sterility.

While there is, then, no doubt that puberty and adolescence form one of the critical periods of a woman's life, yet the changes which occur during it and the function of menstruation with which we are particularly concerned are all perfectly natural phenomena. A natural mode of life is accordingly the ideal to be aimed at, and since we cannot prescribe a return to nature in the strict sense, I would interpret a natural life in terms of our civilization as one that is characterized by "moderation in all things," and one that avoids extremes in any direction. Too strenuous or laborious a life, too much physical or too much brain work, too frivolous an existence, or one that is seriously irregular in any respect may do irreparable harm to the girl as regards her reproductive functions.

But almost as much damage, alike to the reproductive functions and to the nervous system and the girl's whole mental outlook, may be brought about by so treating her that she grows up with the idea that she is a subject of a very special physical delicacy at these periods. This tendency to regard the menstrual function as one of really unnatural delicacy is a relic of the past, and to understand it we must look backwards for a moment. It is only within the last thirty years or so that the function of menstruation has been studied in anything like a scientific way. Previous to that time it was of all the obvious physiological functions of the human body perhaps the least understood. From time immemorial it has been considered to be a function imbued with mystery, and it was always regarded in the earlier days with an interest which was respectful, and frequently not devoid of fear. This element of mystery has had great practical significance, because not only did it, on the one hand, prevent any intelligent study of the function, but, on the other hand, it fostered the growth of an enormous volume of superstition and baseless speculation round it. Researches into the folk-lore of all nations and tongues show that this feeling was universal.

Time does not permit that I should dwell on the erroneous and often fantastic views that have been held concerning menstruation, but a very brief reference to this

aspect of the matter is essential. From prehistoric days the function of menstruation has been very variously regarded, but the most generally prevalent notion was that it was a cathartic or cleansing process, a periodic ridding of the female system of some obscure impurities. As a result of this view the menstrual discharge was regarded as having peculiarly noxious properties, and the menstruating woman as being impure. This idea appears throughout all early literatures, and is familiar to us in the Mosaic law as well as in the early religious laws of Gentile nations. It has persisted in one form or another through all the ages, and customs based upon it are still legally extant amongst orthodox Jews as well as amongst many primitive peoples. It is not ten years since a cook in my own household refused on a certain day to make jam, and it eventually appeared that her reason was that she was menstruating, and that she believed that if she made jam in such circumstances it would become mouldy.

From this belief, which with innumerable variations in picturesque and frequently lurid detail prevailed universally for untold centuries, arose the equally universal custom of regarding the menstruating woman as a person to be segregated and forbidden to take part in the ordinary social and religious life of the people. From this extreme view in turn there evolved, as civilization increased, the belief, still so prevalent, that the function of menstruation produces temporarily a condition of peculiar bodily delicacy, which ought to debar the woman from, and certainly tends to unfit her for any very active exercise or concentrated mental work.

Again, while such ideas and customs prevailed in regard to the ordinary menstruation of the adult woman, the dangers from every point of view were held to be greatly enhanced at the commencement of the menstrual function in the adolescent girl. As a natural consequence of this an atmosphere of peculiar reticence and mystery has long surrounded the adolescent female in this respect, and a popular view of her special physical delicacy at this time has descended to us. Such popular views, even when based on ignorance and superstition, generally have some truth in them, derived from the accumulated experience of ages; and this last view certainly points in much the same direction as our modern physiological observations.

One other point of some practical importance seems to me to have a distinct connexion with those old traditional views of the nature of menstruation, and that is the almost universal employment of euphemisms and numerous more or less fanciful periphrases in speaking of menstruation. I am inclined to think that if we could trace this custom far enough back we should find that it originated in a superstitious fear of mentioning the menstrual function by name, lest some evil should befall the owner of such an unguarded tongue. Furthermore, I would ask you to recall to mind how many of our modern periphrases have a distinct pathological suggestion about them. We ask a woman when she was "unwell" last, or when her last "monthly illness" occurred, or when she was last "poorly," and so forth. In itself this terminological point may be a small one, but I submit that it is only one of many more or less intangible and indefinable influences which in the last generation or two have tended more by the force of suggestion than by any specific teaching to foster amongst women the idea of undue bodily delicacy at the menstrual epochs. This impression is liable to be passed on from mother to daughter—again perhaps more by the forces of suggestion and example than by precept.

The mothers of the present younger generation are, it seems to me, only slowly emerging from the influence of the traditions which used to regard a day or two in bed or on the sofa, with the comfort of a hot-water bag and the stimulus of a bottle of smelling salts, as the normal and wise mode of life for a young woman at her menstrual periods. We have, as a profession, to dispel the lingering relics of such morbid tradition; and if we can do so now the next generation of girls will suffer less from dysmenorrhoea, for we are all familiar with the vitally important part which the psychology and the mental outlook of the patient play in regard to that particular symptom. This is one of the points which the war brought home to me. I have had many patients who have told me that before the war they suffered regularly and severely from dysmenorrhoea, but that when they were employed in the hard work of nursing or driving ambulances in France—work which brooked no interruption on account of anything but absolute physical disability—their dysmenorrhoea entirely disappeared. In some cases it began again after the return to normal existence with its opportunities for greater self-indulgence.

The other side of the picture shows the baleful influence of overwork, either physical or mental, to which I have already referred; and our business in each individual case is to try to strike the happy medium, and to inculcate in our adolescent girls a sane, healthy understanding of the function of menstruation as a natural physiological function, during which a moderate amount of wholesome exercise, which will promote the circulation through the pelvic organs and prevent constipation, is actively beneficial.

This brings me to my last point—namely, the necessity of explaining the significance of the menstrual function to girls as they reach puberty. I believe that this is best done individually rather than by class instruction, and the girl's own mother is, or ought to be, the best teacher. If the mother be devoid of the necessary wisdom, knowledge, or tact, then it may well devolve upon the school teacher, or even upon the family physician. But in every case some degree of simple teaching is, in my opinion, desirable. For the mother or responsible guardian to shirk or avoid what is always a difficult and delicate duty, and to leave the girl unprotected to absorb distorted and possibly evil teaching from her older companions, is to expose the child to the risk of shock and fear which may easily have a pronouncedly bad effect upon both body and mind, and may insidiously taint her whole outlook upon the great and vital mysteries of sex.

II.—INFLUENCE OF THE GENERAL HEALTH ON MENSTRUATION.

BY

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MENSTRUATION usually commences about the age of 13 or 14 in healthy girls, and is commonly believed to become established as a painless and regular function after some months.[1] The subject for discussion includes all measures (whether in childhood, at the commencement of puberty, or during the years succeeding its onset) which favourably influence the process, either by promoting general health or by directly affecting the menstrual function.

(*a*) A high level of general health, attained before puberty and maintained after it, is undoubtedly the chief agent in securing normal menstruation.

(*b*) Measures taken during the menstrual period itself—which is but one phase in a continuous cycle of changes[2]—are of less consequence. The regime practised during the pre-menstrual phase is probably of greater importance than that carried out during the stage of haemorrhage.

The standards by which the effect of any plan of regulation can be judged during school years are the presence or absence of pain or other molimina and the regularity and quantity of the flow, though the final test of the efficiency of the function is child-bearing capacity when adult life is attained. The health of girls has been greatly improved since the introduction of regular games into school curricula. A high standard of physical and mental fitness is thus assured when the changes of puberty appear. With the supervention of menstruation it becomes necessary to decide whether active games should be continued during the period or not. It is undoubtedly true that active games may be continued by many persons during menstruation without harm and perhaps with benefit. In view of this some authorities advocate this practice in schools and assert that it results in a lowered incidence of dysmenorrhoea.[3],[4] My experience leads me to question the validity of this conclusion and to doubt the wisdom of encouraging the habit as a school rule. I base this view upon the

results obtained in St. Andrews School for Girls. I inherited from my distinguished predecessor, Dr. John Moir, the rule that games, gymnastics, Swedish drill, and dancing are stopped during the first three days of the menstrual period, though walking exercise is continued except by those who are definitely incapacitated. So satisfactory are the results that I have seen no reason to make any change. The girls of this school are drawn from the well-to-do classes of society. The diet, housing, and school buildings are good and the standard of health is high. I have excluded from my figures all cases in which the notes were incomplete.

Frequency of Dysmenorrhoea.

The cases of dysmenorrhoea are divided into those who suffer regularly at the "period" and those who suffer occasionally. In each group the heading "severe" includes any girl who has to lie down at these times, if only for an hour or two, even when this is necessitated by faintness only. Each girl is questioned by me at her medical examination on admission to school—that is to say, as soon after the onset of her catamenia as I have the opportunity of seeing her. I do not repeat the inquiry except in case of illness. I have, however, obtained from the housemistresses information about all girls in school in April, 1927.

In the interpretation of statistical data upon such a subject the personal equation of the examiner must be taken into account, while the known variations in susceptibility to painful stimuli, the influence of suggestion, and the effect of intercurrent ailments also influence the results.

Table I shows the frequency of dysmenorrhoea among the 384 girls questioned for the first time.

TABLE I.—*Girls (384) Questioned for the First Time.*

No pain		78.3 per cent.
Occasional pain:		
Slight	8.3	
Moderate	1.5	12.1 per cent.
Severe	2.3	
Regular pain:		
Slight	5.4	
Moderate	3.6	9.2 per cent.
Severe	0.26	

Ages of Girls Questioned.

12 years	2	16 years	53
13 ,, ...	52	17 ,, ...	47
14 ,, ...	131	18 ,, ...	13
15 ,, ...	84	Not noted	2

Excluding occasional dysmenorrhoea, the percentage free from regular pain is 90.4, a figure practically identical with that given by Mrs. Clow[3] in 1924 (89.2 per cent.) for girls who played games throughout the period. As the regime adopted in the two schools differs widely it is evident that the uniform low rate in each is due to some common cause, unconnected with habits during the period.

In corroboration of my results I add a table of 258 observations made independently by the housemistresses, which agrees closely with the figures already given, if due allowance is made for the improvement that undoubtedly occurs as age advances.

TABLE II.—*Observations by Housemistresses (258 Girls).*

No pain	78.3 per cent.
Occasional pain:	
Slight	10.08 per cent.
Moderate	0.77 ,,
Severe	2.3 ,,
Regular pain:	
Slight	3.8 per cent.
Moderate	4.2 ,,
Severe	0.3 ,,

Ages of the 258 Girls.

13 years	4	17 years	74
14 ,, ...	28	18 ,, ...	21
15 ,, ...	59	19 ,, ...	2
16 ,, ...	70		

Concerning improvement with advancing age, the only reliable data are to be got by a comparison between the symptoms of the same individual at different ages. The following table gives the results in 149 girls questioned by me on their admission to school on the first occasion, and by the housemistresses in 1927 on the second occasion.

TABLE III.

	Questioned by me.	Later by Housemistress.
No pain	75.1 per cent. ...	75.8 per cent.
Occasional pain:		
Slight	10.0 per cent. ...	10.7 per cent.
Moderate	0.6 ,, ...	2.6 ,,
Severe	2.0 ,, ...	0.6 ,,
Regular pain:		
Slight	6.0 per cent. ...	3.3 per cent.
Moderate	5.3 ,, ...	4.0 ,,
Severe	0.6 ,, ...	2.6 ,,

The intervals between the first and second examinations are shown below.

Years since Admission.	No. of Girls.	Years since Admission.	No. of Girls.
Under 1 year ...	33	4 to 5 years	5
1 to 2 years... ...	41	5½ years	1
2 to 3 ,, ...	48	Not noted	1
3 to 4 ,, ...	20		

The conclusion which I would suggest from these figures, when taken in association with those published by Mrs. Clow, is that the low incidence of dysmenorrhoea is attributable to a good standard of general health incident to the playing of active games, but that the continuance of games during the menstrual period is not necessary in order to obtain a low incidence of dysmenorrhoea. Is it then advisable?

In healthy individuals there is no need for any restriction of activity at the menstrual period, but the problem in schools differs from that in private practice. The element of competition, to which the Medical Women's Federation[4] wisely draws attention, enters largely into the spirit of school games, with the result that there is a tendency for girls to attempt to play in matches and to persist in playing hard even when suffering from some disability. Another factor in the life of the modern boarding school affects this question. The daily routine represents a continuous strenuous effort from the beginning of each term to its end. The housemistresses are all agreed that the three days' reprieve from games, etc., during the menstrual period is of great value in providing relaxation and recovery of energy. Under our present system the absence of girls from games excites no comment, and, though in many instances the prohibition is at first resented, the three days' periodic rest is of undoubted advantage.

Regularity of Menstruation.

It is generally assumed that, though the first few periods may occur at irregular intervals, a regular rhythm is established within a few months. Thus the following statement is made[5]: "In healthy well developed women between the ages of 14 and 44 menstruation occurs once a month. . . ." This is certainly not so in the school from which my figures are drawn, in which, for example, among 78 girls questioned at the age of 17 only 43 experienced regular menstruation. Table IV shows the percentage of regularity at different age periods.

TABLE IV.—*Percentage of Regularity of Menstruation.*

Ages.	Regular.
13 and 14	20.5 per cent.
15 and 16	45.8 ,,
17, 18, and 19	62.1 ,,

Intermittent amenorrhoea is the type of irregularity present. If the common belief is true it is impossible to view these figures without alarm, since they indicate a persistent deficiency of ovarian secretion[6] in a large proportion of the potential mothers of the future. Upon inquiry it is commonly found that a normal period occurs during the holidays in girls who are amenorrhoeic during the school term. In my opinion the cause of this defect is to be looked for in the long hours of continuous effort, mental and physical, imposed upon the adolescent girl by the modern school curriculum. Munro Kerr[7] makes the following statement:

"It is an interesting fact that the very athletic and those whose occupation involves great physical and mental strain have in many instances a relatively poor menstrual discharge."

Professor McIlroy[8] writes:

"When girls at puberty are urged to work for examinations the first danger signal is often amenorrhoea or irregular scanty menstruation," and she urges that "great care must be taken to find out if the individual is of a normal standard of health before permitting strenuous games or strain of study."

Rosenau[9] makes some statements which are of interest in this connexion:

"The effect of overwork upon fecundity and upon infant mortality is impressive. Broggi states that of 172,365 Italian women between the ages of 15 and 54 years who were employed in industrial occupations the average child-bearing coefficient was only about one-third of the general fertility of Italian women."

I direct your attention to this matter as of prime importance in connexion with menstrual health and one upon which this Association might collect information and provide authoritative guidance to school authorities. Many of these exact from girls under their care an amount of daily effort, mental and physical, which few adults could undertake. The result of this, coupled with the anxiety associated with competitive examinations and games, is, I believe, reflected in the figures which I have just quoted.

I have been unable to find in the available literature data upon which this question can be decided. Comparative tables in regard to the frequency of regularity among girls leading sheltered, moderately strenuous, and fully strenuous lives would be most informative.

REFERENCES.

[1] Munro Kerr: *Clinical and Operative Gynaecology*, 1922, p. 56. [2] Idem, ibid., pp. 57, 58. [3] A. S. Clow: BRITISH MEDICAL JOURNAL, September 27th, 1924, pp. 558-61. [4] Medical Women's Federation: "Advice regarding menstruation to parents, schoolmistresses, and others in charge of girls." [5] *System of Gynaecology*, by American authors, 1887, vol. i, p. 408. [6] Munro Kerr: Op. cit., p. 63. [7] Idem, ibid., p. 75. [8] A. L. McIlroy: *Practitioner*, July, 1925, pp. 37-42. [9] Rosenau: *Preventive Medicine and Hygiene*, 1923, p. 1288.

III.—THE PREVENTION OF MENSTRUAL TROUBLES.

BY

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My observations on the matter under discussion have been made during a period of fifteen years of general practice, including fourteen years' experience of medical inspection at a large school for girls and of seven years' medical attendance at a training college for teachers. The schoolgirls, except in a few instances, are not my own patients, but are referred for treatment to the medical men attending the boarding houses. I have excluded from consideration all cases in which there is disease of the pelvic organs; my remarks refer only to girls in good health.

Age of Onset of the Catamenia.

One of the most striking things in studying the normal menstrual function is the variation in the age of onset of the catamenia in girls of normal development. In my experience it has varied from 8 to 19 years.

The accompanying list gives the percentage of the various ages of onset obtained from the girls at the school and the training college.

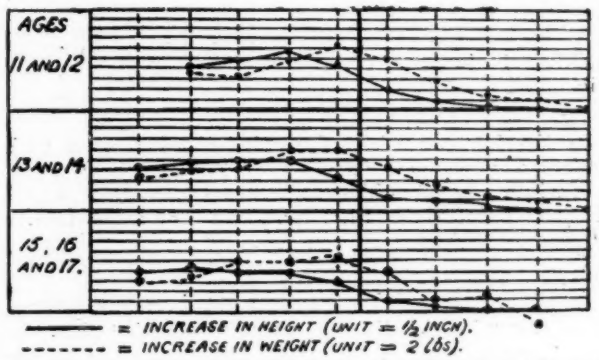
Age of onset.	School (1,137 girls).	Training College (300 girls).
8	0.08 per cent.	0.00 per cent.
9	0.08 ,,	0.00 ,,
10	1.05 ,,	0.33 ,,
11	4.92 ,,	0.33 ,,
12	16.79 ,,	8.33 ,,
13	34.12 ,,	21.66 ,,
14	26.82 ,,	37.33 ,,
15	11.08 ,,	22.00 ,,
16	4.41 ,,	8.00 ,,
17	0.35 ,,	2.00 ,,
18	0.17 ,,	0.00 ,,
Before 14	57.04 per cent.	30.65 per cent.

The figures show that the age of onset was, on the whole, earlier in the schoolgirls, where 13 was the most usual age, than in the college students, in most of whom it was 14. It will be noted that over half of the former (57 per cent.) began to menstruate before they were 14, whereas less than a third of the latter (30 per cent.) began before that age.

The schoolgirls are the children of educated parents in easy financial circumstances. The college students come from humbler, though not necessitous, homes from various parts of the country, and in most cases began their education in elementary schools. Although the standard of health among the latter is good, the schoolgirls are, on the whole, of better physique. It would seem, therefore, that earlier development of the generative organs is associated with physical fitness. It must be noted that, whereas the number of schoolgirls from which these figures are obtained is over 1,100, my experience in the case of the students has, so far, been limited to 300.

A difficult, but very important, question to decide is, When does the delay in the onset of the catamenia become pathological, and how soon should treatment, if any, be begun? Most parents become anxious if the menses have not appeared before the fifteenth birthday. In searching for an answer to this question, I have tabulated the annual increase in height and weight of those girls who have been at the school for several years before and after the onset of the catamenia. In order to show the relation between the rate of growth and the age of onset I have divided the figures into three groups, according to the age at which the menses appeared, as follows:

	Ages.	
Group I	11 and 12	50 girls
Group II	13 and 14	188 ,,
Group III	15, 16, and 17	60 ,,



The graphs represent the average rate of increase in height and weight in the three respective groups; therefore, until they touch the base line growth is continuing. The thick vertical line indicates the year during which the onset of the catamenia occurred. The vertical spaces represent the four years preceding and the four years subsequent to the year of onset.

The following facts are brought out by the charts in all these groups:

1. The maximum growth occurred during the second and third years preceding the onset of the catamenia, followed, a year later, by the maximum increase in weight.
2. During the year in which the menses appeared there was a definite fall in the rate of growth in both height and weight.
3. Growth in both respects continued for at least two years after the onset of the catamenia.
4. Notwithstanding the difference in age in Groups I and III there is a marked similarity in the curves.

In studying the actual figures one was struck by the facts:

1. That there was no exception to the rule that growth in height and weight took place, but at a reduced rate, after menstruation had begun.
2. That, although the majority of girls had ceased to grow at 16, and many had by that time begun to lose weight (the normal occurrence in girls soon after growth is completed), nevertheless, those in whom the onset of menstruation was delayed until 16 or 17 years continued to grow until they were 18 or 19; whereas those who began to menstruate early ceased growth correspondingly early.

These facts incline me to the view that we are not justified in regarding a case as one of primary amenorrhoea, or in attempting to interfere with the natural course of events, so long as growth in height and weight continues.

The cases which give cause for anxiety are those in which the secondary sexual characteristics have not begun to develop by the age of 15, especially if the rate of growth in height and weight has begun to diminish. After the age of 17 this must be a rare condition. I have only come across two cases in the 2,600 girls I have examined, and two adult cases in my own practice. Both of the girls, now adult, have remained sexually undeveloped in spite of treatment from the age of 14. Endocrine therapy had no apparent effect.

Interruption of the Regular Periodicity.

Of the three types of secondary amenorrhoea which I have noted as peculiar to adolescence, one only is of serious import, and belongs to the realm of medicine rather

than of hygiene. I have found irregularity of periodicity in the majority of girls (54.5 per cent.) during the first two years of menstrual life. The cases of amenorrhoea are more numerous among the boarders than the day girls; they are usually unassociated with any disturbance in health, and, in my opinion, seldom call for medical treatment.

Suffering Associated with the Menstrual Period in Young Girls.

I can state with certainty that menstruation can be, and therefore should be, free from suffering of any kind. This was the case in 89.2 per cent. of the schoolgirls at their last interview, and in 94 per cent. of students on leaving the training college. We can, consequently, take it as a fact that when menstruation is normal the girl is free from any pain, headache, sickness, or feeling of discomfort. This is the state of affairs we have to aim at for every girl in the country. It would help to bring this about if inquiry into the menstrual function were recognized as an essential part of the medical inspection of girls in schools and factories. It seems that the existence of the menstrual function has been ignored by school doctors in the past. The keeping of records would not only provide us with valuable information, but would give patients requiring advice the opportunity of receiving attention early enough to prevent the onset of serious trouble.

It is very rare for any symptoms to occur during the first few months of a girl's menstrual life; as far as I can ascertain it occurs in only about 2 in 1,000 cases. This fact is worthy of thought, especially when it is coupled with the fact that when I first began my work in the school I found that 220 in 1,000 cases had developed some menstrual trouble within four years of the onset of the period. If a girl is allowed to be guided by nature as to her behaviour during the period she will, in nearly every case, carry on as usual. The desire for activity, whether it be in games or work, is no more diminished than is her desire for food or sleep.

Most educated mothers teach their daughters that they must not expect to feel well at these times and that they must modify their habits of life accordingly. They are told that it is dangerous to have a bath, or even to wash, especially the feet. They must give up their games and drilling at school and all avoidable exercise, and, if possible, spend part of the day lying down. Every year I come across scores of girls who have received this teaching, and in nearly every case there is a spontaneous expression of pleasure when I tell them that, provided they obtain consent from home, they may have their warm baths, and cycle, join in such games as hockey and tennis, and do drilling and gymnastics as usual. I lay special stress on the importance of taking this exercise on the first and second days of the period.

The result of this instruction, which has been given for the last thirteen years to each individual girl who has arrived at the age of puberty, is that the proportion of those who suffer at the period has been reduced from 46.7 per cent. to 10.8 per cent. The 10.8 per cent. of sufferers consist mostly of those who do not succeed in getting permission from home to take the necessary exercise. Given free scope, we could, I believe, abolish practically all menstrual suffering in healthy girls under 18 years; and if the habits with regard to exercise acquired by that age were continued into adult life, suffering at the period would, I believe, be a rare complaint. I have already published[1] figures and cases in support of these statements, and have referred before to the leaflet *Advice to Girls Concerning the Monthly Period*,* issued by the Medical Officers of Schools Association, in which the continuance of baths and vigorous exercise throughout the period is recommended. Many thousands of these and of similar leaflets published by the Medical Women's Federation† have been distributed to schools and factories, and I look forward to the time when all healthy girls will be brought up in accordance with the hygienic measures therein advocated.

Girls engaged in sedentary or standing occupations are the greatest sufferers from dysmenorrhoea. This will continue until employers of women workers realize, as some already have to their own advantage, that this disability, and consequent loss of work, can be stopped by giving opportunity for daily exercise, such as could be obtained by fifteen minutes' drilling, preferably in the open air.

There is no doubt that the neurotic disturbances connected with menstruation are generally produced by unwise suggestion and example, and that their cure lies in inculcating sound views with regard to the menstrual function, resulting in healthy activity of mind and body during menstruation, as at other times.

The prevention of menstrual troubles lies with the parent, the schoolmistress, the school doctor, and the employer of women workers. With healthy conditions and influences in the home, the school, and the factory, I believe that there would be but little call for treatment of menstrual disorders in otherwise healthy girls.

REFERENCE.
[1] Menstruation During School Life, BRITISH MEDICAL JOURNAL, October 2nd, 1920; Dysmenorrhoea in Young Women, ibid., September 27th, 1924.

DISCUSSION.

Mrs. ETHEL VAUGHAN-SAWYER (London) said that menstruation might be regarded as a vicarious pregnancy; it should be painless and should not interfere with the ordinary activities of life. Normally the only concomitants should be a certain lassitude and some increase of nervous tension. She was firmly of opinion that there was a close connexion between dysmenorrhoea and the toxaemias, particularly the exanthems of childhood, like scarlet fever and measles. In many cases of dysmenorrhoea there were associated septic tonsils. Just as the fevers caused a weakening of the musculature of the heart so did they affect the uterine muscle. The occurrence of anteflexion, and more rarely of retroflexion, might be traced to softening of the muscles produced by one or other of the diseases of childhood. At one time it was quite common to meet with severe cases of salpingo-oöphoritis following a severe attack of enteric fever. In regard to the question of hygiene she advocated daily warm baths, but was opposed to cold baths and sea bathing during the period. She thought that moderate exercise was undoubtedly beneficial, but strenuous games might be rather too much.

Dr. G. I. STRACHAN (Cardiff) dealt with the mental aspect of the hygiene of menstruation as seen in the practice of a mental hospital. From a study of about 200 mental patients he had found none in whom the onset of insanity could be definitely attributed to the onset of menstruation. In cases where menstruation was influenced in mental disease it was usually in the direction of excess, and he had found no justification for the textbook statement that insanity was usually accompanied by amenorrhoea. Before puberty girls should be informed of the coming event and should be impressed that it was quite natural; during uncomplicated menstruation an absolutely normal life should be led with regular exercise and bathing. Irregularities in the first few years were seldom important, and might be disregarded.

Professor GIBBON FITZGIBBON (Dublin) said that schoolgirls were generally brought to see a gynaecologist on account of amenorrhoea, very rarely for dysmenorrhoea. He thought that the cases of severe disabling dysmenorrhoea at the age of 20 to 25 were nearly all acquired dysmenorrhoea in which no trouble had been experienced in the earlier years. The causes required further investigation. In the case of girls with dysmenorrhoea dating from the onset there was commonly some definite pelvic disease, which might quite probably be traced to the acute infections of childhood.

Professor LOUISE MCILROY (London) agreed that every healthy girl should regard menstruation as a normal function; cases of dysmenorrhoea were rare before the age of 18. Girls without occupation suffered most frequently from dysmenorrhoea; having nothing to do, their attention was focused on their sexual functions, and not infrequently

* To be obtained from the honorary editor of *School Hygiene and Physical Education*, "Cropthorne," King's Norton. (2s. per 100, 17s. 6d. per 1,000, post free.)

† To be obtained from the Secretary, Medical Women's Federation, 9, Clifford Street, Bond Street, W.1. (1s. 8d. per 100, post free.)

they were cured by marriage. In factory girls the incidence of dysmenorrhoea was very low and was confined, as a rule, in that class to clerks and those whose occupations necessitated sitting all day. She did not regard dilating and curetting in these cases of occupational dysmenorrhoea as of any value; the only remedy was to advise exercise, dancing being one of the best forms. She was convinced that vigorous games had nothing to do with sterility, whereas mental stress might be held responsible.

Dr. CATHERINE CHISHOLM (Manchester) stated that her figures, obtained from schoolgirls of a different type from those studied by the openers of the discussion—namely, the industrial type—were nevertheless remarkably similar. The incidence of dysmenorrhoea was much higher in active working women than among schoolgirls. She thought that the nervous strain of examinations or overwork was a potent cause from the failure of the general health arising therefrom. Similarly in sedentary workers it was the impairment of general health which resulted in dysmenorrhoea. It was very important, especially in day schools, that games should be made part of the curriculum, not added to an already overcrowded programme.

Dr. MABEL L. RAMSAY (Plymouth) said that though she had charge of a school of 200 girls the only cases of dysmenorrhoea she ever saw occurred at about the ages of 20 to 25. The economic aspect of bettering the working girl's condition was of supreme importance. Dysmenorrhoea was generally associated with some error of bodily growth. She strongly deprecated the wholesale removal of tonsils, and said that the public were becoming seriously alarmed in this matter. She agreed that the specific fevers, especially mumps, might often give rise to pelvic troubles. She did not approve of too many hot baths, but preferred to continue with cold baths and sea bathing.

Dr. FARQUHAR MURRAY (Newcastle) had seen a large number of girls, aged 18 or 19, who had never menstruated, and examination showed a definite lack of development of the uterus. Cases with very scant menstruation were often associated with dysmenorrhoea. To stimulate the development of an infantile uterus treatment must be begun early, and endocrine therapy should not be delayed until they thought that bodily growth was complete. Profuse menorrhagia in adolescents was sometimes a very difficult problem. He deprecated hysterectomy in young girls, while x rays and radium generally damaged tissues with which they came in contact.

Dr. LILIAS M. JEFFRIES (Brighton) did not agree that violent exercise should be forbidden. She advocated leaving it to the housemistress to decide which girls should be permitted to play games. She thought that there was an insufficient provision against the occurrence of constipation in schools. Hockey was no more vigorous than Swedish exercises, but she disapproved of sea bathing. She denied that fecundity was adversely affected by vigorous games and exercises.

Professor J. HENDRY (Glasgow) maintained that it was of even more importance to attend to the general health during the intervening twenty-eight days than during the actual period of the flow. He favoured vigorous exercise during the whole month, such as tennis and badminton, and not merely walking. He did not think that modern dancing was vigorous enough to serve this object. In hospital practice the difficulty was to get patients to carry out the advice given to them, and it was in this connexion that they must look for improvement by the establishment of welfare centres.

The PRESIDENT commented upon the much diminished frequency of anaemia nowadays compared with thirty years ago; he thought that this caused a rarer occurrence of dysmenorrhoea. He referred to the great improvement in conditions in the elementary schools where girls were no longer forced through various standards regardless of all considerations of health.

Dr. W. F. T. HAULTAIN (Edinburgh) thought that constipation had a great deal to do with dysmenorrhoea in girls about the age of 18, and suggested that girls should be encouraged to drink more water. It was particularly necessary to treat the constipation which occurred during the week prior to menstruation; cure of the constipation often relieved dysmenorrhoea. Cold baths should not be allowed as they tended to stop the flow, whereas hot baths and exercises increased it. He thought the association between dysmenorrhoea and the specific fevers was far too vague to be relied upon.

Dr. B. M. SUTHERLAND (Australia) thought that the big factor in diminishing the occurrence of dysmenorrhoea was the great increase in open-air exercises for girls in these days. He urged the necessity of treating every case individually and not by applying a general routine to all regardless of individual peculiarities. He warned them that the statistics of chosen schools could not be applied indiscriminately to the general public. He spoke favourably of shower baths instead of plunge baths and strongly opposed sea bathing during the flow.

Professor JOHNSTONE, in replying, said that there was an enormous amount of evil done by suggestion, whether unconscious or otherwise. He agreed that in regard to hygiene the pre-menstrual days were if anything of more importance than the actual period. The question of constipation was of great moment; miracles could be performed with the aid of magnesium sulphate. General principles being agreed upon, every case must be treated on its merits.

Dr. PATON defended the rule against violent exercise by pointing out that though some girls might suffer as the results of it, others would be saved from the suggestion of invalidism from which they could not escape if they were singled out as individuals. He had always thought that constipation had a very important bearing on dysmenorrhoea, but on investigation he was surprised to find among his limited numbers that there was no apparent connexion. They were not in the habit of taking any special precautions at the first menstruation, and no harm had resulted so far as he knew. He was disappointed at not hearing more about persisting irregularities.

Dr. ALICE CLOW had found no dysmenorrhoea or amenorrhoea among girls working for examinations. It was very rare for a girl to leave after a strenuous course at the training college with any menstrual trouble at all. She thought it lamentable that even 10 per cent. of dysmenorrhoea occurred, and she believed this could be wiped out by exercise, suggestion, and so forth. Dilating and curetting were quite unjustifiable.

THE POLICE SURGEON IN RELATION TO FORENSIC MEDICINE.

THE TEACHING OF FORENSIC MEDICINE.*

BY

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THE duration of the course and the range of teaching of the subject of forensic medicine to students of medicine have long occupied the attention of teachers as well as of the General Medical Council.

For many years the subject has been a compulsory part of the examination for degrees and diplomas, and consequently of the medical curriculum of study. Owing to its character it is one of the final year classes, inasmuch as it is expected to deal with the previous subjects of the curriculum which may have a bearing on the law of the country, in accordance with the definition of forensic medicine, which is:—that subject which correlates medical knowledge to the purposes of the law.

If one makes a general survey of the medical curriculum

*A paper read in opening a discussion in the Section of Forensic Medicine at the Annual Meeting of the British Medical Association, Edinburgh, 1927.

it will be apparent that many, if not indeed most, of the subjects therein embraced involve some measure of practical or laboratory teaching and knowledge.

The student of anatomy has to spend much time in the anatomical laboratory, as has also the student of physiology; the student of surgery and of medicine spends some years in the wards of the hospitals acquiring practical acquaintance with the various phases and kinds of disease and their methods of cure, in addition to some laboratory work in operative surgery and in the practical aspects of medicine; in midwifery he has to be certified as having attended so many cases of childbirth and to show some knowledge of gynaecology; in chemistry the amount of knowledge which he can absorb in the time allotted for its study, although inclusive of some laboratory work, at the best permits of but a very circumscribed sphere of knowledge; in botany his acquirements must be reckoned as elementary, although he has opportunities of distinguishing ordinary plants and fruits which are poisonous from those which are non-toxic; in zoology he may gain some knowledge regarding those lowly forms of life which play such important parts in the production of the diseases of animals and of man; in materia medica he is made more familiar with poisons and drugs for curative purposes; and in pathology he is brought face to face with the pathological aspects of diseased organs as contrasted with those in health, and he is supposed to pay sufficient visits to the *post-mortem* room as will enable him, when called upon, to conduct effectively a *post-mortem* examination for medico-legal purposes. But all of these, in addition, form the subjects of didactic lectures which the student is bound to attend. Comprehended within such knowledge which he so acquires is, or ought to be, his facility of applying that knowledge to practical medico-legal work.

It may be said that, while in the hospital wards, he may be able on occasion to see odd cases of poisoning—such opportunities are relatively rare; and that in the out-patient department he can see the results of injuries from many and different causes. All this undoubtedly ought to be helpful to the student; but he has to keep in mind that, sooner or later, when he becomes a duly qualified registered medical practitioner, he is likely to be called upon to deal with very many problems, occasionally some of them especially difficult, which will compel his attendance as a witness in courts of law. Hence the more purely legal aspects of forensic medicine come into prominence, and the class of forensic medicine is the only opportunity of becoming acquainted with these, in addition to his reading.

From the nature of the subject itself forensic medicine is, therefore, apt to be one of those few subjects which are not capable of being readily applied with practical tuition in all their phases.

From his profession the practitioner is expected to render assistance to cure and, if possible, to save the lives of his patients; but he can never rid himself of the likelihood that the doing of this may involve his appearance in the witness-box as a skilled witness, whose object ought to be to assist the court in arriving at an intelligent knowledge of the medical aspects of the case, for the elucidation of some of which careful observation and logical thinking are always much needed. Two things are essential in medico-legal work: first, careful observation and record of the facts of a case, and, secondly, logical inferences or deductions from these facts. It has been truly observed that the differences in medical testimony not infrequently witnessed and heard in law courts emerge more frequently not so much from the facts of a case as from the inferences or deductions made therefrom. The value of a witness, to be of assistance to a court, will therefore much depend upon his scrupulous consideration of both of these.

It has sometimes been urged that instruction in forensic medicine, as in some other subjects, may as well be obtained from books as from lectures. While there may, perhaps, be something to be said for this view, the value of lectures will largely depend, if not almost entirely, upon the practical experience of the lecturer. This goes without saying; but there is a great difference of value between the lectures given by a teacher who is in constant and immediate touch with the practical aspects of forensic medicine and those given by one whose knowledge is chiefly theoretical and obtained from books. Over an experience of forty-five years as a teacher of this subject to students of medicine and of law the foregoing observation has impressed itself more and more on my mind.

That leads to the question whether forensic medicine courses could be better arranged than at present so as to afford the student a more active and practical acquaintance with the subject.

I think it can be said with truth and appositeness that in Scotland the universities and colleges have taken the teaching of this subject as an important item in the curriculum of the general practitioner. Chairs have long been founded in three of the universities, and a lectureship in the fourth, the length of courses being determined by the university ordinances and the regulations of the General Medical Council. Examination papers are set for that subject at each final degree examination, and thereafter each student is examined orally and practically. In the Scottish colleges the subject, for diploma purposes, is bracketed with public health, two questions in each subject being set for answer, and an oral examination follows.

Is there any feasible and workable plan by which the average student might acquire more practical knowledge than hitherto he has been able to gain or is obtaining at present?

It has been suggested that during the curriculum the attention of the student might be directed to the medico-legal aspects of each subject: in medicine, for example, to the differences in behaviour of acute and chronic gastro-intestinal diseases and the acute and chronic forms of irritant poisoning; in surgery to the significance of wounds and wounding from the point of view of causation; in botany to know what common plants and fruits are poisonous and which non-toxic; in pathology, not merely a voucher that the student has attended so many *post-mortem* examinations, but that he has actually assisted in making or has himself performed at least one complete dissection. While that is not impossible, the retort comes that no teacher has sufficient time to teach even the subject with which he is charged, without traversing other fields. But even on the supposition that this were possible, it must be obvious that there are many departments of forensic medicine, comprehended in criminal charges, which the student cannot observe in his ordinary curriculum; for example, he is hardly likely to see a case of infanticide or criminal abortion, or to have seen carried out in detail the lines of investigation regarding productions of crime in the form of suspicious stains for blood on garments or weapons, or for semen in charges of rape, or of stains in cases of throwing of vitriol or other corrosives. Taking, however, more ordinary things first, such as making a proper *post-mortem* examination for medico-legal purposes, it seems to me that the average young practitioner at present has had little, if any, experience. But he may be called upon in England on the summons of a coroner to make or assist in making such an examination. In Scotland, on the other hand, the duty of appointing the medical practitioners to perform this work is in the hands of the procurator fiscal of the county in which the examination has to be made, and only even then when a warrant of the sheriff has been issued in set terms incorporating the names of the practitioners who are to conduct the examination. This duty in Scotland is made to devolve on experienced practitioners only, because very important issues may emerge from their examination respecting the cause of death, if such, as is commonly the case, be a culpable cause.

There are in Scotland two classes of medical practitioners who are more or less constantly faced with medico-legal questions. These are (1) police casualty surgeons, and (2) medico-legal examiners appointed by the Crown for that purpose.

The police casualty surgeon obtains his appointment from the magistrate and town council, as in Glasgow, Edinburgh, Dundee, and other places. The range of his duties embraces the examination of persons alleged to be "drunk" or intoxicated from alcohol; the examination and first-aid treatment of persons alleged to have been injured or assaulted; the examination of the bodies by inspection only of those who have died suddenly or under suspicious

circumstances; examination of children alleged to be the subjects of neglect and ill-treatment by parents or guardians; the examination of the mental condition of alleged insane persons found wandering in the streets or behaving there in an insane manner; and the examination of children and young persons alleged to have been criminally assaulted. These, perhaps, comprise the main duties of his office. In some instances, however, his duties may involve medical attendance on members of the police force, although in some places, as in Glasgow, these are not included.

The medico-legal examiner has a different range of work to pursue if and when called upon. He will be expected to perform all *post-mortem* examinations of the bodies of persons with respect to whose deaths there is alleged to be suspicions of or actual culpability, and to make reports of the results to the procurator fiscal, from whom their warrant comes from the sheriff, and to make examinations of productions regarding the nature of certain suspicious stains thereon, connected with a criminal charge against a person apprehended or still at large, by laboratory methods. All these investigations—and they are of varied character—demand the most exacting care and attention to secure accuracy of results, since from these and the inferences therefrom the release of a prisoner or an indictment for a crime of a serious kind may depend. It is obvious that such examinations as the foregoing cannot be entrusted to the hands of a novice or inexperienced person. In charges of murder, for example, it is likely to be that the same medico-legal examiners who made the *post-mortem* dissection will also have the duty of examining such productions as the Crown may deem necessary. In the examination for blood-stains, for example, much time and painstaking work must be devoted in order to ensure accurate results, and especially, as more frequently happens nowadays, the examiner is expected to be able to prove whether the blood, if found, is that of a human being or not. When the investigation involves toxicological search, the medico-legal examiner will likely be associated with an expert chemist, and thus the Crown will receive a joint report. In the foregoing, therefore, are fields worthy of cultivation, which might be utilized for the purposes of practical teaching in forensic medicine.

In the light of what has preceded we now approach an answer to the question: What scheme, if any, might be evolved for the better practical teaching of the student in forensic medicine?

Experience indicates that the first essential of likely success in teaching this subject will be that the teacher should himself be actively engaged in a branch of the profession which deals largely with medico-legal problems, either in the capacity of a police casualty surgeon or as a medico-legal examiner. Such positions afford material ready to the hand of the teacher whereby he may illustrate many points of his teaching, while the medico-legal examiner as teacher, by utilizing the services of a few students at a time as assistants in examination of cadavers, will afford them opportunities of observing how to act and how to frame reports. Such a class of teacher has, moreover, an excellent chance to collect photographs of cases which, shown as lantern slides in the lecture room, will pictorially illustrate to an entire class several points of interest. Laboratory investigations may also be given to classes of students either in the lecture room or in the laboratory itself, and demonstrations of microscopic objects and museum jar specimens can similarly be exhibited. All of the foregoing methods I have combined for many years past. The formation of a class museum of illustrative specimens is a valuable adjunct.

The more definitely legal aspects of the subject must in the main be treated didactically by lectures. The law has to be expounded in an easy manner to induce attention, for it is my experience that the average student fights shy of law, not realizing that such a knowledge is likely to conduce later to his comfort and assurance in doing medico-legal work. There must be a simple exposition of the laws of evidence, of the functions of the General Medical Council and its powers of discipline on those registered as medical practitioners, the penal offences constituting "infamous conduct in a professional respect"; some things must be said respecting the law of infanticide, etc., as to nullity of marriage, as to sexual crimes, and to insanity with respect to responsibility for crime; and several others. The subjects having medico-legal importance to the profession have, however, increased in later years—such, for example, as the National Health Insurance Acts, Workmen's Compensation Acts, Notification Acts, the Cremation Act, Death Certification, etc. The student will benefit by some instruction on these subjects, for to many young practitioners the quickest avenue to general professional work is the acquirement of a panel of patients, and sooner or later he may receive an appointment as a certifying surgeon, and become eventually, perhaps, a medical referee under the Compensation Acts. Judges have on occasion expressed the view that there are no witnesses so difficult to be heard or so difficult to be understood as medical witnesses—difficult to be heard from want of audible speech in giving evidence, and difficult to comprehend because of the nature of their evidence. The medical witness in a court of law must remember that medical language is not understood by an ordinary jury, however much better it may be by counsel and judge, hence he must avoid the use of technical medical language.

A visit of a student to a court of law during a trial is worth much, in so far as it enables him to see the surroundings, hear witnesses being examined-in-chief and cross-examined, and to observe the conduct in these of members of the Bar. I have found it an excellent plan to recommend students to attend the sittings of sheriff and jury courts, and of the High Court of Justiciary when available, while trying criminal cases. Such opportunities commonly occur during the progress of a teaching term, and courts, as I have found, are most willing to give students facilities for being present.

Some such scheme, broadly sketched and as has been carried out, may be reckoned to make the course of teaching forensic medicine not only more interesting during the student's career, but also further calculated to turn him out after graduation or qualification a better equipped man for the medico-legal side of his work.

DISCUSSION.

Professor J. E. W. MACFALL (Liverpool) considered that the teacher should be one who had gained experience by being in touch with the problems involved; for that he should hold an appointment as police surgeon. He should also be an efficient pathologist in order to gain the confidence of the coroner. In England the subject was taken too early in the student's course, and should be left to the final year. The actual forensic investigations should be organized into a service, since at present so much depended on the inclination or prejudices of individual coroners.

Professor SYDNEY SMITH (Cairo) considered it necessary to provide means for the education, not only of the student, but also of the medical practitioner, in the subject of forensic medicine. The course of lectures and practical training of the student was comparatively easy to arrange, and was not of the same order of importance as the instruction of the practitioner. In this country there appeared to be no definite status for the medico-legal expert, and any medical practitioner might (and did) perform *post-mortem* and other examinations in medico-legal cases and give evidence thereon. When it was considered that the medical evidence in a criminal case might result in the loss of life or liberty of an individual, it seemed most improper to allow evidence to be given except by a person with special training in the particular subject. There must be quite a considerable amount of crime undetected or unsuspected on account of the want of special knowledge of the examiners. The training of specialists in the subject of forensic medicine must include practical experience in a medico-legal department, and such a department could exist only by obtaining all the medico-legal cases for definite districts. It would also give the legal authorities a definite place to which they could send all their material for opinion, and where the investigating authority could obtain advice and assistance in cases where technical knowledge was required. The beginning of some

such system was advocated some time ago when the Medico-Legal Society in London decided to urge the formation of a medico-legal institute. It should be possible to establish such institutes, not only in London, but in other centres, so arranged that the whole of the medico-legal work of the country could be under expert supervision. The speaker instanced the conditions in Egypt, where all medico-legal cases of any importance came automatically under the notice of the Medico-Legal Department of the Ministry of Justice. This department, which consisted of whole-time medical officers, chemists, and other officials, was attached to the Parquet, an investigating authority. All cases of poisoning, in whatever part of the country they occurred, all examinations of blood and other stains, and, in fact, all technical examinations, were carried out in the central laboratories at Cairo, while experts were available for advice and assistance in the different centres. A similar scheme could readily be inaugurated in this country, and the cost would almost certainly be less than the cost of the present haphazard system of payment to different local practitioners. The speaker gave actual figures for his own department, which showed that if the work done had been paid for by the case the cost to the country would have been about four times as much.

Dr. A. ALLISON (Glasgow) regretted that students and most practitioners had to rely on accounts of cases. The average man was only rarely called to court, and if he had a special interest in medical jurisprudence it was difficult for him to obtain the necessary post-graduate instruction. If the teaching of forensic medicine was to be improved three things were required: (1) increased opportunities for personal observation on the part of both undergraduate and post-graduate students; (2) opportunities of gaining experience in laboratory investigations; (3) opportunities for the discussion of medico-legal problems, preferably in a mixed society of doctors, lawyers, and other interested persons. Much might be done by organization to satisfy these three conditions. In towns having a medical school a centre for *post-mortem* examinations might be provided by the local authority, but it would probably be better if an arrangement could be made with the pathological department of a hospital. It would be an advantage if all cases of poisoning admitted to hospital were collected into one ward. In any big hospital there would be enough cases annually to demonstrate the effects of the commoner accidental and suicidal poisons, and laboratory work could be easily arranged. For the post-graduate student intending to follow the special work of forensic medicine full facilities ought to be provided. The only medico-legal society in Great Britain held its meetings in London, yet in all large centres there were many doctors and lawyers interested in medico-legal problems, and provincial societies should be formed. Academic study should be supplemented by practical experience, which could be obtained by assisting a police surgeon in his routine work.

Dr. DOUGLAS KERR (Edinburgh) pointed out that a medico-legal service could grow up in a similar manner to the public health service, the first essential being that one man specially interested, and later one specially qualified, should be officially appointed for a given area. All forensic questions and *post-mortem* examinations in the area should be referred to him in the first instance, and not be undertaken by practitioners ignorant of this branch of medicine.

Professor J. T. J. MORRISON (Birmingham) said that medico-legal practice in England in the sphere of crime was not encouraged in due proportion to its legal and social importance. The financial departments of public bodies were reluctant to authorize coroners to retain the services of medical experts in elucidating complex problems where crime or unnatural death was known or suspected. Too often it was thought that *post-mortem* examination might be assigned to any doctor, and investigations demanding special skill and knowledge were entrusted to persons who were unfamiliar with the questions to be solved and with the procedure involved in their solution. He deplored the fact that forensic medicine was put in the background in English teaching centres, and was frequently taught by men who were not in touch with medico-legal practice.

Dr. HINCKS (Hay) instanced cases of difficulty to the general practitioner.

Lord RUSSELL said that since the medical curriculum was already so heavy he was glad to hear suggestions of post-graduate teaching in this subject.

Sir W. SCHRODER (Coroner for Central London) thought there should be a central mortuary where *post-mortem* examinations could be made, and, under certain regulations, be open to persons who wished to obtain knowledge in pathology and to be taught forensic medicine. The teacher should be one whose duty it was to deal with dead bodies, and that was, in a majority of cases, the police surgeon. The difficulty was that the work of the police divisional surgeon was not sufficient in itself to employ his whole time; private practice would not tend to increase his interest in criminal work.

Professor GLAISTER, in reply, said that after many years of work as police surgeon and medico-legal examiner in Glasgow he suggested that the police should know something of the elements of medical jurisprudence, and for some years now the police and detective departments had received instruction on that subject. Thorough *post-mortem* examination was an important part of a medico-legal examiner's work, and in Glasgow there was a centre where bodies were brought for this examination. Financial considerations prevented many improvements being added.

THE ABUSE OF CAESAREAN SECTION.*

BY

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ONE great difficulty I have in writing on the abuse of Caesarean section is that almost everything I can say on the subject has been anticipated by Professor Whitridge Williams of Baltimore, and has been put much better than I can put it. In what I say, however, I am not merely adopting his views—my own have been formed independently, but they coincide with his. Even in 1917 he anticipated the title of this paper. On the other hand it is a very great advantage to have his authority to support my own attitude. In 1916, when addressing the Clinical Congress of Surgeons of North America, he spoke as follows:

"Unfortunately history shows that advances in the practice of medicine and surgery are rarely attained in a thoroughly rational manner, but that a period of undue enthusiasm, or even of almost reckless abuse, usually precedes the establishment of the actual value of a given procedure. . . . I believe that we are at present going through such a stage in connexion with Caesarean section."

Again, in the last edition of his *Obstetrics* he writes as follows:

"With the increasing perfection of surgical technique, and an erroneous idea of the safety of the operation, there seems to be a growing tendency to regard Caesarean section as the simplest means of coping with most obstetrical difficulties. At the present time I consider that the operation is being abused, and that not a few patients are sacrificed to the *furor operativus* of obstetricians and general surgeons who are ignorant of the fundamental principles of the obstetric art. This being the case, the conscious obstetrician should be particularly careful in the recognition of indications for Caesarean section."

It would be an easy matter to quote similar opinions presented by other writers, but I think Williams's authority is sufficient. I think, too, that it, together with the statistics which I shall put before you, will establish my two main points:

First, that Caesarean section should be avoided whenever possible, on account both of its immediate risk and of its possibly crippling effect on the patient.

* This paper, read before the Australasian Medical Congress at Dunedin, New Zealand, early this year, has been a little curtailed and some appended statistical tables omitted in order to ensure publication.

Secondly, that Caesarean section is seldom necessary, because the art of midwifery provides a more satisfactory alternative.

The mortality following Caesarean section varies directly according to the stage at which the operation is done. The figures collected by Holland in 1921 prove this very clearly. Caesarean section for contracted pelvis done before labour begins caused a mortality of 1.4 per cent.; early in labour a mortality of 1.8 per cent.; late in labour a mortality of 10 per cent.; after a preliminary induction of labour a mortality of 14 per cent.; after attempted forceps a mortality of 25.7 per cent.; after attempted craniotomy a mortality of 50 per cent. I wish to emphasize the fact that even when the operation was done under the most favourable circumstances the mortality was 1.4 per cent.

This is a low mortality—lower, perhaps, than is actually the case. Williams's corrected statistics for *all* cases in his hospital—corrected by the exclusion of deaths which were not attributable to the operation—give a mortality of 3.35 per cent. He divides his cases into two periods. In the first period he operated at any time during labour, often after a prolonged second stage. The mortality was 12 per cent. In the second period the operation, whenever possible, was done before, or a few hours after, the onset of labour. The mortality was 2.45 per cent. Further, he considers that the general mortality in the United States of all cases is 10 per cent.

The cost of Caesarean section done late in labour is very high. As Williams says, the evidence is clear that whenever a considerable time has elapsed between the onset of labour and the performance of Caesarean section, we must take into consideration the probable existence of a latent infection, which may later give rise to a general peritonitis. To prevent this there is apparently only one remedy, and that is to substitute a radical for a conservative operation, and to remove the uterus. Such a course reduces the mortality very markedly. Williams records 56 cases with a mortality of 1.8 per cent. It is, however, a high price for a young woman to pay.

Perhaps if it was possible to get into the mind of the operator who unnecessarily resorts to Caesarean section late in the second stage that his duty is to remove the uterus as well as the infant, it might induce him to try obstetrical methods of delivery before resorting to surgical ones.

I think we may take it as a fact that every case in which an unforeseen Caesarean section has to be done for obstructed labour is directly due to a failure of diagnosis—that is, in the great majority of cases, to insufficient or inefficient ante-natal care. I do not mean to suggest that diagnosis is always possible. Theoretically it may be. Practically it may not. I think, however, that if the causes of obstruction that cannot be recognized before or at the beginning of labour be examined it will be found that the correct treatment for most of them is not Caesarean section. Ante-natal care and diagnosis is one of the surest ways of avoiding unnecessary operations, of enabling us to do the necessary ones at the proper time, and so of reducing the mortality to a fifth of what it would otherwise have been.

I am quite aware that it is customary in many places to practise in contracted pelvis what is called the test of labour and, if delivery fails, to perform a Caesarean section late in labour. I cannot give a general approval to such a course. In the first place, careful examination and internal measurement with Skutsch's pelvimeter will usually enable us to decide whether Caesarean section is the proper course to adopt, while, if there is a reasonable prospect that the patient will deliver herself and she fails to do so, pubiotomy is preferable, especially in multiparae. There are undoubtedly borderline cases in which an exact prognosis is impossible, and in such the obstetrician who attends them must decide according to his own views. I would like, however, emphatically to protest against the idea that a test labour can be substituted for exact preliminary diagnosis, because the object of the latter is to exclude, so far as is possible, the necessity for the former.

The risks of Caesarean section do not end with the convalescence of the patient, because there is in all cases the danger that a permanent injury may result to the uterine wall, which is thereby thinned and prone to tear during a subsequent labour. Theoretically, it should be possible to produce a union of the incision which, after a short time, is indistinguishable in appearance or strength from the rest of the muscle. Practically, there is always the risk that unsuitable suture material, bad suturing, or sepsis of the wound may cause a weakening of the scar. That the risk is a real one is shown by Holland's collected statistics. Seventy women were delivered, or delivered themselves, through the vagina after a previous Caesarean section, and in 18, or about 25 per cent., the scar ruptured during labour. Rupture during pregnancy is rarer, but it, too, may occur.

Again, peritoneal adhesions, while they are not necessarily dangerous to life, and may be symptomless, are not an advantage. Williams, in forty-eight women who had been operated on in his own clinic, found subsequent "broad or dense adhesions" in one-third. In others who had been operated on elsewhere he found them still more frequently. Accordingly, a young woman on whom Caesarean section is done may be left in such a state that she is unable to have a normal labour subsequently, she may be rendered permanently sterile by the loss of the uterus, or she may lose her life from the risks inseparable from the operation. The obvious conclusion from these facts is that Caesarean section must be avoided whenever it is possible to do so. The three most common conditions in the treatment of which Caesarean section is most abused are probably the milder degrees of contracted pelvis, eclampsia, and placenta praevia.

The milder degrees of contracted pelvis offer perhaps the largest field for the irresponsible operator. As Williams puts it: "I have been reluctantly forced to the conclusion that, in many parts of the country, the mere diagnosis of a contracted pelvis, irrespective of degree, is considered a satisfactory indication for the operation."

There are usually considered to be four degrees of contracted pelvis. In flat pelves whose true conjugate measures $3\frac{1}{4}$ inches or more there is very seldom an indication for operation. When the conjugate measures between $3\frac{1}{4}$ to $2\frac{3}{4}$ inches, Caesarean section is permissible, but can be replaced by the induction of premature labour, or by pubiotomy. In the other two degrees Caesarean section is positively indicated. The vast majority of contracted pelves fall into the first, or the upper limit of the second degree—Williams places it at about 95 per cent., and of these 80 per cent. deliver themselves spontaneously. The selection of the correct line of treatment is entirely a matter of exact diagnosis, as made by internal and external measurement of the pelvis, and by estimating the relation of the foetal head to the pelvic brim. External measurement alone is valueless. A general practitioner who has not had a very large midwifery experience is most unwise to undertake the management of such cases, and the routine performance of Caesarean section does not lessen his responsibility. To the obstetrician whose experience entitles him to treat such cases I would like to say:

"Learn how to use Skutsch's pelvimeter. There is no mystery about it. The ordinary mechanic learns to use measuring instruments which are much more difficult to handle. You can learn its use on the dummy almost as well as on the patient. It is usually necessary to give an anaesthetic, but the number of women who must be measured internally is very small. If it was a question of an ordinary gynaecological examination, you would not hesitate to give an anaesthetic if necessary. Why should you hesitate when the welfare, and perhaps the life, of both mother and child are at stake? It is necessary to exhaust all the powers of diagnosis before you advise your patient that a Caesarean section is unavoidable."

Eclampsia is probably the next most common cause of the abuse of Caesarean section, and that, too, in spite of the fact that its results prove it to be almost the most fatal line of treatment. I pointed this out at the Christchurch meeting of the New Zealand Medical Association in 1923, and a short time afterwards I met a medical practitioner who has a large obstetrical practice. He told me that he and a friend had listened to what I had said at the meeting, and that—I think his words were—they had never laughed so much before. I suggested that it was unkind of him to have laughed at me. He replied, "We did not laugh at

you. We laughed at the idea of anyone doing anything but Caesarean section for eclampsia." Let us see what it was he actually was laughing at.

Eden in 1922 published an exhaustive analysis of the results of eclampsia as treated in Great Britain and Ireland. One of his conclusions was that, both in mild and in severe cases, Caesarean section and accouchement forcé were followed by the highest mortality—a mortality which Holland found to amount to 32 per cent. after Caesarean section.

Petersen found that in the United States the mortality of eclampsia radically treated was 34.8 per cent., and Williams at Baltimore, prior to 1916, treated by radical measures 85 cases with a mortality of 24.7 per cent.

In Germany Engelmann reported a mortality of 26 per cent. and Lichtenstein a mortality of 16.7 per cent.

The results of conservative treatment, on the other hand, are given as follows: Williams was able to report a mortality of 13 per cent., Engelmann of 6 per cent., and Lichtenstein of 9.4 per cent. after they had changed round to conservative treatment. FitzGibbon and Solomons reported 204 cases with a mortality of 10.3 per cent. Stroganoff collected 3,302 cases treated by his method with a mortality of 10.4 per cent., while in more than 230 cases which he treated personally the mortality was 2.5 per cent. Incidentally I may say that he stated that the mortality in New Zealand was 25 per cent., but I do not know where he got his figures. The statistics which I am just about to quote show a mortality of 22.9 per cent.

What my friend laughed at, then, seems to have been methods of treating eclampsia which reduced a mortality of between 16.7 per cent. and 34 per cent. to one of between 2 per cent. and 13 per cent. Even in his own country of New Zealand facts are against him. I have recently analysed the results of 149 cases of eclampsia reported by different medical practitioners. Conservative treatment in 104 cases gave a mortality of 15.38 per cent.; Caesarean section in 29 cases of 27.5 per cent., and accouchement forcé and allied procedures in 16 cases of 43.7 per cent. I have no reason to think that the cases treated by Caesarean section were any more serious than those treated conservatively. It is generally recognized that there is a place for Caesarean section in the treatment of eclampsia, but it is a very small one, and, practically speaking, is only to be found amongst the cases in which conservative treatment has failed to bring about any improvement.

Placenta praevia comes next, and here, too, the results obtained from Caesarean section, as compared with those of more conservative measures, are directly opposed to its routine use.

Holland reported that the mortality in the British Isles after Caesarean section in 139 cases was 11.5 per cent. R. W. Holmes estimated that the similar mortality in the United States was 20 per cent. On the other hand, purely obstetrical treatment has given the following results. Williams, who uses the Champetier de Ribes bag, had one death in forty cases, or 2.5 per cent. Hofmeier, Behm, Lomer, Essen-Möller, Pinard, and Stratz have recorded a total of 603 cases treated by Braxton Hicks's method, with a mortality of 2.9 per cent. I recorded a short time ago 264 cases which had occurred at the Rotunda Hospital with a mortality of 5.3 per cent. I am able to say that a number of the patients who died were moribund on admission, and could not have been treated by Caesarean section. If these cases are excluded, as they should be in any comparison with the results of Caesarean section, the mortality would have been about 3 per cent.

Unless we are prepared to accept obstetrical incompetence as a valid indication for Caesarean section, the only justification for it in placenta praevia is that it will save more infants. As Holmes says, in the United States operation saved one baby for every mother it killed. I do not think that in ante-partum haemorrhages the prospect of life possessed by a premature infant, weakened by maternal and often by foetal haemorrhage, is sufficiently valuable to place in competition with the life of the mother.

There is a place for Caesarean section in the treatment of placenta praevia just as there is in the treatment of eclampsia, but it is a very tiny one. A foetus that is viable and that has not been weakened by previous bleeding, a mother who is in good condition, and a placenta which is central give, I think, a good reason for doing Caesarean section in order to save the foetus.

There are still a few conditions left which serve as reasons or excuses for Caesarean section. Malpresentation of the foetus is one of them. I think that since I was qualified I have known personally of two cases in which Caesarean section was done for transverse presentation. In one the mother died, in the other both mother and child lived. The former was catastrophic, the latter—peculiar.

In the morning, an hour and a half after the rupture of the membranes, the medical attendant found a transverse presentation by external examination. He did nothing. In the evening he found the cord and a hand in the cervix by internal examination. He gave the patient morphine. The next morning, as meconium was coming away, he did a Caesarean section. The patient was 24, and had had two normal confinements. His reason for his treatment was that the uterus was throughout in a state of tonic contraction, but the fact that the child was alive and well twenty-four hours after the membranes ruptured is rather opposed to this. No attempt was made to see if the contraction would pass off under an anaesthetic or to correct the presentation by internal version.

I would make the following suggestions:

(1) That almost every case of neglected shoulder presentation, in which the child is alive, can be changed to a foot presentation by internal version.

(2) That if the presentation cannot be changed the amount of force required to bring the foetus out of the pelvis during a Caesarean section must be so great as to be injurious to the uterus.

(3) That such a case would almost invariably be infected, and that consequently a hysterectomy is always necessary.

(4) That when the child is dead there is no possible indication for Caesarean section.

I have the records of 209 cases of transverse presentation treated in the Rotunda Hospital. I do not think that decapitation has ever been done on a living child, nor has delivery ever been effected by Caesarean section. In other words, in every such case it has been possible to correct the presentation. I am, of course, excluding cases in which operation may be necessary, not on account of the presentation, but because the pelvis is contracted, or other form of gross obstruction exists.

I said that there was a tiny place for Caesarean section in the treatment of placenta praevia. I do not think there is even this place for it in the treatment of transverse presentation.

Time will not allow me to discuss the other forms of obstructed labour that have been used as a reason or an excuse for Caesarean section. There are undoubtedly several forms in which the operation may be necessary, and amongst them I am afraid that rigidity of the cervix is sometimes included. I had thought that this ancient bugbear of the obstetrician had passed away with the midwife who kept her fingers in the vagina throughout labour. Still, should a bona-fide instance of it occur, I am inclined to think that it should be possible to remove it by obstetrical measures, instead of removing the child by surgical ones.

Some Statistics of Results of Obstetrical Operations in Certain Maternity Hospitals.

At the Bellevue and Associated Hospitals in New York, 4,268 patients were confined. Caesarean section was done once in 97 cases. The death rate from eclampsia was 48 per cent., and after Caesarean section 7 per cent. The total death rate was 25 per 1,000.

At the Boston Lying-in Hospital, 1,133 patients were confined. An obstetrical operation was performed once in every 2.4 cases, and Caesarean section was done once in every 12 cases. The death rate from eclampsia was 54 per cent., and the total death rate was 22 per 1,000.

At the Jefferson Hospital in Philadelphia, 1,453 patients were confined. Caesarean section was done once in every 6.3 cases; the general death rate was 23 per 1,000.

With these may be contrasted the similar statistics of the Rotunda Hospital for thirty-four years ending 1922. There were 57,412 confinements. Caesarean section was done once in every 366 cases. The death rate from eclampsia was 12.5 per cent., and the total death rate was just under 5 per 1,000.

Is it any wonder that Williams speaks of "an abuse of the operation (Caesarean section) which can be attributed only to an obsession by the *furor operativus*"?

I do not think that the accuracy of the statistics I have given can be disputed. Assuming that they are correct, is it possible for anyone to advise the operation for conditions that can be equally well, or even better, cured by obstetrical measures? Further, can anyone fail to recognize the necessity for such careful ante-natal examination of the patient as will enable us to operate under the most favourable circumstances whenever Caesarean section is really necessary?

There is a glamour which attaches itself to the operation of Caesarean section in the minds of the public, and a kind of spurious fame. I am sure there is no need here to warn against any attempts to encourage such absurdity, but perhaps it is well to suggest the wisdom of definite efforts to kill it. I know no better way of so doing than by medical men bringing their patients to recognize that, as I have said before, practically every case in which an unforeseen Caesarean section due to obstructed labour is necessary is directly due—at any rate theoretically—to insufficient or inefficient ante-natal care. Moreover, I am quite sure that, whether with or without medical guidance, the public will some day recognize the fact for themselves. It is entirely preferable, when this happens, that the medical profession should be able to say, "We told you so."

I have written a little strongly, but I think it will be seen that every opinion I have expressed is shared by obstetricians of the highest rank. I think, too, that many will agree with me that there is a real danger of obstetrics becoming a lost art. R. W. Holmes foresaw this danger ten years ago, and I do not know that it has grown any less since then. There are several ways of combating it, but this is not the time to discuss them. It is, however, a good time to remember that the conscientious medical adviser cannot justify himself when he tries to replace a lack of obstetrical knowledge by mere surgical facility.

I dislike very much bureaucratic interference with the liberty of the individual unless it is unavoidable, but voluntary co-operation would be most welcome. I think that if medical practitioners generally would furnish the Health Department with information regarding cases in which they found Caesarean section necessary they would materially help to check any abuse of the operation, and so to reduce maternal mortality.

Conclusions.

Finally, I should like to summarize briefly the conclusions which I think must be drawn from the facts I have put forward.

1. Caesarean section done under the most favourable conditions is associated with a mortality of nearly 2 per cent., and may be followed by peritoneal adhesions, and subsequent rupture of the scar.

2. Caesarean section done under unfavourable conditions is followed by a mortality of from 10 per cent. to 50 per cent., and in patients who survive the risk of after-complications is greater.

3. The only way of avoiding such operations is careful ante-natal diagnosis, and the only way of reducing their mortality when they are necessary is to remove the uterus.

4. Unless there is good reason for thinking that the uterine incision has healed satisfactorily, it may be unwise to allow a patient to deliver herself at subsequent pregnancies.

5. The treatment of eclampsia by Caesarean section is followed by a mortality of from 16 per cent. to 34 per cent. Conservative treatment is followed by a far lower mortality.

6. The treatment of placenta praevia by Caesarean section is followed by a mortality of from 11 per cent. to 20 per cent. Obstetrical treatment is followed by a far lower mortality.

7. The necessity for treating a transverse presentation by Caesarean section is almost unknown. When it occurs, it is also necessary to remove the uterus.

8. The statistics of hospitals in which Caesarean section is extensively done, unless they are based on a foundation quite distinct from that of other maternity hospitals, do not offer any encouragement to those who would imitate their producers.

Perhaps it would be wise to disarm criticism by admitting at once that my paper has not got a single new idea in it, or any promise or even suggestion of a new idea to come. It is more or less a plea for reversion—reversion to the older and saner ideas that used to govern midwifery practice generally, and that still govern it in most places. If Truth lies in front of us, it is well to go forward, but if we have overshot her and she is behind us, it is necessary to turn back. Discretion is the better part—of midwifery.

BIBLIOGRAPHY.

Williams, J. W.: *Obstetrics*, 1924; *Surg., Gyn. and Obstet.*, 1917, xxv, 194-201; *Trans. Amer. Gyn. Soc.*, 1901, xxvi, 260-276; *Johns Hopkins Hosp. Bull.*, xxxii, 1921, 173-184.
Holmes, R. W.: *Surg., Gyn. and Obstet.*, November, 1915.
Holland, E.: *Journ. Obstet. and Gyn. Brit. Empire*, 1921, xxviii, 358-446; *Proc. Roy. Soc. of Med.*, 1920, xiv. (Gyn. and Obstet.), 22-124.
Eden: *Journ. Obstet. and Gyn. Brit. Empire*, 1922, xxix, 386-401.
Engelmann: *Zeitschr. f. Geb. u. Gyn.*, 1911, lxviii, 640-664; 1920, 1113-1128.
Stroganoff: *Journ. Obstet. and Gyn. Brit. Emire*, 1923, xxx, 1-31.
Solomons: *Journ. Obstet. and Gyn. Brit. Empire*, 1922, xxix, 416.
Jellett: *Lancet*, 1910, i, 1271; also *New Zealand Med. Journ.*
Tottenham, R. E.: *Irish Journ. of Med. Sci.*, November, 1925.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

MÉNIÈRE'S DISEASE TREATED BY THE ELECTROPHONIODE.

WHATEVER the true pathology of this disease, it presents a definite clinical entity, is extremely rare, and most distressing. First described by Ménière in the *Gazette Médicale de Paris* in 1861, the patient died, and the *post-mortem* examination revealed haemorrhage into the semicircular canals. Cases have, however, since been reported as having presented all the clinical signs of the disease in which *post-mortem* findings have failed to give evidence of haemorrhage into the canals.

A spinster, aged 43, consulted me early in April for severe vertigo and nausea. She was deaf in the left ear, hearing only a shout at one metre; the deafness was accompanied by tinnitus.

Her first attack occurred in August, 1926, when she fell to the floor from vertigo. She noticed that the left ear had become deaf after the attack. Consciousness was not lost nor has it ever been lost during the attacks; memory was, however, almost completely abolished. She was very dejected; the attacks of vertigo had become much more frequent both by day and night. The longest vertiginous attack lasted two hours, but the average duration was about half an hour. She had to crawl on all fours about the house and in going up and down stairs, in order to try and avoid an attack.

The trouble being labyrinthine, I at once began treatment with the Zünd-Berguet electrophoniode. Within a week very definite improvement was manifest, and at the end of a fortnight she was able to attempt walking alone. Progressively with treatment the vertigo gradually disappeared, and with it the nausea. Now, after an interval of over two months, she has had no recurrence. Her deafness is better to the extent of hearing a low voice at one metre, the tinnitus is less, and memory has been regained.

I am confident that in the electrophoniode otologists possess a very useful treatment in cases hitherto deemed hopeless, but its uses and limitations have yet to be defined.

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PULMONARY EMBOLISM FOLLOWING CHILDBIRTH.

HAVING read the cases of pulmonary embolism following childbirth reported in the BRITISH MEDICAL JOURNAL of November 6th, 1926 (p. 835) by Drs. McCulloch and Young, and on November 27th (p. 987) by Drs. Spencer and Dawson, and knowing such complications to be considered rare, I am sending you the report of a similar case which was under my care.

A young woman, aged 30, healthy and robust (5-para), had for some years suffered from varicose veins in both legs. I saw her on September 2nd, 1922. She was then in labour, with frequent slight haemorrhages. The cord was prolapsed, and the implantation of the placenta low. As the cord was strongly pulsating and dilatation was occurring quickly, no intervention was attempted. She delivered herself in the course of an hour of a healthy female child. The puerperium was uneventful, temperature, pulse, and lochia being normal. She was eating and sleeping well and nursing the baby, and used to remark on my visits how well she felt. Never at any time did she complain of pain in the legs. She was sitting up in bed on the ninth and tenth days. After lunch on the eleventh day she was sitting up in bed, and the nurse was putting on one of her stockings, when she suddenly complained of severe pain in the chest, and fell back in the nurse's arms. When I arrived she was livid, with profound dyspnoea and air hunger; she died within fifteen minutes of the onset of the sudden pain.

No necropsy was performed, but I think no doubt could be thrown on the diagnosis.

Possibly pulmonary embolism following childbirth is not as rare as the textbooks would have us believe.

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Reviews.

TO BEGIN WITH.

THE stimulus which led Professor RAYMOND PEARL to write *To Begin With*,[1] the subtitle of which is "Prophylaxis against Pedantry," was a doubt whether the results achieved by the "highly formalized and mechanized system of education which prevails in the land and is in such perfect accord with the cultivation of that efficient, standardized mediocrity which seems to be the very spirit and genius of American civilization" are wholly satisfactory. Professor Pearl is not the only doubter. "Our present difficulty," wrote an Oxford professor a few years ago, "is that our students often attain to technical dexterity without acquiring the mass of knowledge which is needed if their skill is to be profitably employed" (Watson's *Life of Bishop John Wordsworth*, p. 109). That was said of theological and philological research, but it is equally true of biological and medical work. Professor Pearl writes:

> "What I used to do was to make out lists of highly technical researches in the particular field of interest and tell the student that along that pathway was the road to salvation. This I am sure was a mistake. It started from a false assumption. The progression was forthwith to the special on the supposition that the general has been taken care of But nothing could be more ridiculous nonsense than such an assumption. In consequence of the widely prevailing pedagogical theory that needlework, jig-sawing, salesmanship, and many other kindred academic disciplines are of at least equal cultural and intellectual value in the training of our youth to the study of Greek or Latin or mathematics or chemistry; coupled with the permission, if not active encouragement to the undergraduate to specialize during his mental infancy, it results that when the young things begin serious graduate work a solidly grounded general background upon which to build a sound specialism is precisely what, generally speaking, they most completely lack."

Professor Pearl's remedy, or palliative, is to bring to the notice of his students books which are either essentially great literature or, at least, illuminate some aspect of human life and work (or play) which is not a mark-returning subject of academic education. It is unlikely that any two men would approve the whole of Professor Pearl's list, it is still less likely that any educated man would object to the inclusion of a very large majority of the items, and we hope, but do not much expect, that young men and women turning out theses for the degree of Doctor of Philosophy will not only read Professor Pearl but take his advice. For indeed, although Professor Pearl writes easily and wittily about it, the evil which he sees is a very great one. At least no medical journalist will underrate it. Every year hundreds of papers are published on a level of technical efficiency which was not attained a generation ago by any writers or only by writers of the greatest ability. But the general value of these papers in an intellectual sense is greatly below their technical standard. We would even go so far as to say that while the best papers now printed are as good as or better than the best printed fifty years ago, much more pure nonsense—more both absolutely and relatively—now finds its way into print than in the past. The reason is, as Professor Pearl contends, that we are producing not educated human beings but technicians. In 1848 Macaulay made this entry in his diary:

> "I received to-day a translation of Kant from Ellis's friend at Liverpool. I tried to read it, but found it utterly unintelligible, just as if it had been written in Sanscrit. Not one word of it gave me anything like an idea except a Latin quotation from Persius. It seems to me that it ought to be possible to explain a true theory of metaphysics in words which I can understand."

We may conceive the scorn with which our young post-graduate philosophers would smile at so philistine a demand. Metaphysics and medicine we shall be told have progressed so far that nobody can hope to understand the description of any research within their fields without prolonged technical training and, as everybody cannot be technically trained in every branch—even of his own profession—it would seem to follow that we must all be mutually incomprehensible. Perhaps this is true, but there is another hypothesis which covers the facts. It is that young people are now so poorly educated that they can no longer express themselves in what was once the common speech of cultivated men, and take refuge in jargon. The dean of the faculty of letters of Paris—quoted by Professor Pearl—complains that

> "in these papers on my desk are lines that are ridiculous. If they were published, they would be taken for the inventions of a humorist. In a single page of Latin we commonly find a dozen examples of bad spelling. We don't write French any longer because we don't speak it. That's the whole difficulty."

Perhaps there is no remedy. It is so hard to earn a living that very few people can afford to look upon education as something more than a means towards a pecuniary end, and that sort of education is technical education. Still, perhaps something may be done by calling the attention of our post-graduates to good books; Professor Pearl may possibly save a few souls and even save the world from a few doctoral theses.

[1] *To Begin With; being Prophylaxis against Pedantry.* By Raymond Pearl. New York and London: A. A. Knopf. 1927. (Cr. 8vo, pp. 96. 5s. net.)

THE HISTORY OF B.C.G.

WHATEVER may be the outcome of Professor Calmette's work on the bacillus Calmette-Guérin (BCG), there can be no doubt that his researches and theories are ingenious and interesting. Criticism of the work so far has been somewhat of the destructive variety, alleging, for example, that the statistics are insufficient, not properly controlled, or unconvincing. Professor Calmette has now published, in collaboration with Drs. Guérin, Boquet, and Nègre, a summary of his researches in a volume entitled *La Vaccination Préventive contre la Tuberculose par le "BCG."*[2]

The argument of the book is that in tuberculosis immunity—meaning thereby resistance to reinfection—only exists when the body harbours some living elements of the parasite; and that when the lymphatic glands are infected by a few slightly virulent bacilli, the individual is pre-immunized against virulent infections. He quotes J. Parisot of Nancy as stating that in tuberculous families 40 per cent. of infants under 2 years of age, and 90 per cent. between the ages of 4 and 10, react to tuberculin; while in non-infected families, although there is no reaction in children under 2, 31 per cent. react at 10 years of age.

The first part of the book before us is devoted to an examination of various attempts that have been made to discover a method of antituberculous vaccination. These attempts appear to show that it is impossible to produce immunity by means of dead bacilli. Experiments with different varieties of bacilli, sometimes modified by various physical or chemical agencies, have suggested that antituberculous vaccination might be efficacious if living bacilli, deprived as far as possible of their aptitude to produce extensive follicular lesions, were used. It was on these lines that Professor Calmette began, about 1903, to experiment with the bovine bacillus.

The second part of the volume describes the experimental study of the BCG. Having arrived at the conclusion that in cattle lasting tolerance of tuberculous infection required the presence in the animal of living bacilli, and seeing that the bacilli in the glands should be incapable of producing tuberculous lesions, Professor Calmette and his collaborators tested the efficacy of pre-immunization by the intravenous injection of the BCG in cattle kept in contact with infected animals. They found the method entirely satisfactory, but the duration of protection did not exceed eighteen months. Incidentally they formed the opinion that a positive tuberculin reaction could not be considered as a criterion of infection, but as a criterion of immunity. Consequently they consider that it loses all diagnostic importance, inasmuch as when everybody susceptible to tuberculosis has been artificially impregnated with avirulent bacilli, they will all react in the same manner as infected subjects.

According to Professor Calmette the immunity is exactly analogous to that produced by other living attenuated virus-vaccines, such as vaccinia, the anthrax vaccine, and

[2] *La Vaccination Préventive contre la Tuberculose par le "BCG."* Par A. Calmette, avec la collaboration de C. Guérin, A. Boquet et L. Nègre. Paris: Masson et Cie. 1927. (6¼ × 9¼, pp. 250; 20 figures. 22 fr. sans majoration.)

that for hydrophobia. As with these vaccines, the immunity only lasts for a comparatively short time. The sole difference is that it is difficult to apply the BCG to adult subjects because so many are already infected by virulent bacilli. Hence the need for using the BCG in the early days of the individual's existence.

After his experiments on cattle and on rabbits, Professor Calmette obtained a trial of his BCG by Dr. Wilbert on a series of monkeys in French Guinea. These monkeys were immunized either by a single subcutaneous injection or by five ingestions by the mouth. The pre-immunization lasted at least a year, and could be renewed by fresh ingestions yearly.

In the third section of his book Professor Calmette describes the preparation of his cultures, the physical and chemical characters of the BCG, and the histological changes associated with its injection. One milligram of BCG suffices to produce tuberculin sensitiveness. But Drs. Boquet and Nègre have established that immunity and tuberculin hypersensitivity are distinct and independent states in organisms infected by the Koch bacillus. Immunity comes later than hypersensitivity. In many cases the extinction of tuberculin sensitivity is not accompanied by any lessening of the resistance to reinfections. Although in many animals a large dose of BCG may cause the internal organs to be studded with follicles or tubercles, these follicles never caseate, and in process of time completely disappear.

The last part of the book is devoted to the methods and results of administration of BCG to infants; and it is against this part of Professor Calmette's work that criticism has mainly been directed. The justification for this criticism is perhaps to be found in the chronicity of tuberculosis, the time required for watching and comparing patients, and the ease with which patients disappear from view when long periods of observation are necessary. Thus, although many thousands of infants have now been pre-immunized in France, the statisticians who have examined the figures have only been able to deal with a small proportion which have been definitely followed up. M. Moine reported on 982 cases treated in the course of two years and seven months. Dr. Ott dealt with some 332 cases in the department of Seine Inférieure and Le Havre. Dr. Biraud studied 1,877 cases of pre-immunized infants; but whether this number included one, both, or neither of the two other groups is not clear.

It is evident that the time has not yet come when a definite opinion can be given on the pre-immunization of infants with BCG. But it is equally evident that the work of Professor Calmette and his colleagues cannot be passed over without investigation. Professor Calmette's proposition is that the only way to produce immunity to tuberculosis is to provoke a state of what he calls pre-immunization during the first days of life; to ensure as prompt an impregnation as possible of all the lymphatic organs with a sufficient number of bacilli to form a true vaccine; and to see that these bacilli are deprived of virulence and at the same time capable of producing defensive substances. He thinks that BCG meets these requirements. But he admits that against intrauterine infection by the so-called tuberculous ultra-virus, investigated by Valtis, Convelaire, and others, BCG may fail to operate, and that it may form an insufficient protection against massive infections. The case is presented in an interesting manner in the book.

FORENSIC PSYCHIATRY.

An Introduction to Forensic Psychiatry in the Criminal Courts,[3] by Dr. NORMAN EAST, is a book which fills a gap in forensic literature. Of recent years much attention has been paid to the mental condition of persons accused of crime, and whilst there is no scarcity of books dealing with psychiatry, these treat the question of mental disease from the medical rather than the forensic aspect, a distinction which, unfortunately, mental experts sometimes fail to appreciate. Dr. East, before his appointment to be medical inspector of prisons, was for many years senior medical officer of Brixton Prison, and in that capacity had a very extensive experience in this branch of forensic work. The results are embodied in his book, which discusses some of the same subjects as the late Dr. Sullivan's *Crime and Insanity*, reviewed in our issue of June 28th, 1924 (p. 1131). Dr. East has had the advantage not only of dealing with insane criminals, but of having under his care persons with regard to whom the question of insanity has been raised but not admitted by the courts. This has afforded him much material, and the chapter on criminal responsibility, a subject bristling with difficulties, is written in an extremely clear and interesting manner.

We do not know of any work which gives such an excellent summary of the matter. Certifiable insanity and a condition absolving an accused person from legal liability are by no means the same, as the author points out, a fact which may at first mislead a medical witness. It does not follow that because a person charged with an offence is found to be insane that he should be certified, or that because he is certifiable he is not responsible for a particular crime. The question of certification frequently presents difficulties in forensic practice, and has lately become so prominent, owing to the number of actions against medical men, that many practitioners are unwilling to accept responsibilities in this matter, as every police surgeon is aware. The inclusion in the next edition of a chapter on certification would add to the value of a most excellent work. The book is clearly written and well illustrated with cases, a point of great value in forensic work. It will make an appeal not only to the mental expert but to all engaged in criminal cases.

NEURO-PSYCHOLOGY.

Thought and the Brain[4] is the title of a translation from the French of a valuable monograph by Professor HENRI PIÉRON. The author, who is the editor of *L'Année Psychologique*, has made a number of notable contributions to neuro-psychology and is a distinguished and erudite writer. The ideal of science, he observes in his preface, is the highest possible degree of unification, and certainly as far as the problem of body and mind is concerned it undoubtedly aims at the correlation of psychological facts with physiological mechanics. This view would appear to be sound, as also his contention that, whatever certain theorists may say to the contrary, neuro-physiology does often provide an adequate representation of the laws established by psychology, whereas the study of the functions of the brain frequently supplies a satisfactory explanation of psychological phenomena. The validity of such views is made abundantly evident throughout this book, which provides an excellent critical survey of modern opinions regarding the functions of the nervous system.

The book is divided into four parts. In the first an outline of our knowledge of neuro-mental functioning is given, a lengthy chapter being devoted to the problem of localization or the differentiation of function in the cortex. In the second part are considered the receptive and incito-motor functions—the elementary modes of sensorimotor thought. The third part deals with verbal function and thought—the cerebral mechanism of language—and with aphasia. The author gives an admirable presentation of this most difficult problem. The final section is concerned with the affective regulation of mental action, both its role and mechanism being briefly considered. The reader will probably wish that these concluding chapters had been considerably expanded in view of the importance of their subject-matter for our understanding of normal and abnormal behaviour.

This book will interest the practising physician, the neurologist, and the psychiatrist. Mr. Ogden, who has translated it, has done a service to English-speaking readers by introducing the work of a writer who has much of value to communicate.

[3] *An Introduction to Forensic Psychiatry in the Criminal Courts.* By W. Norman East, M.D.Lond. London: J. and A. Churchill. 1927. (Demy 8vo, pp. ix + 381. 16s. net.)

[4] *Thought and the Brain.* By Henri Piéron. Translated by C. K. Ogden. The International Library of Psychology, Philosophy, and Scientific Method. London: Kegan Paul, Trench, Trubner and Co., Ltd.; New York: Harcourt, Brace and Co., Inc., 1927. (Demy 8vo, pp. xvi + 262; 20 figures. 12s. 6d. net.)

PHYSIOLOGICAL CHEMISTRY.

THE vitality of the study of biochemistry in the United States and, presumably, the dissatisfaction with its teaching is testified by the number of new textbooks of the subject which continue to come to us from across the Atlantic. Some have been so bad as to have established no reasonable excuse for existence. Others have been of sufficient merit to be welcomed without reserve if without enthusiasm. Not one—if we may be so rash as to seek to identify the classic in contemporary literature—has borne those evidences of inspiration which would place it beside the older masters whose teaching "shall not grow old."

The latest arrival is *An Introduction to Physiological Chemistry*,[5] by Professor MEYER BODANSKY. Whilst it is unlikely to achieve the most favoured place in the library of the teacher it is certainly not to be classed amongst the bad books. The author's plan is conventional. Indeed, tradition and rigid curricula make it difficult for a textbook to attempt an original approach to the subject. The account given of the chemistry of carbohydrates, fats, and proteins is followed by digestion, enzyme action, and putrefaction. The chemistry of the blood and lymph next invite attention, and then discussion is directed to intermediate metabolism, the urine, and the internal secretions. The volume concludes with chapters on animal calorimetry and nutrition. These are on the borderland of biochemistry and physiology, and are often but poorly handled in such books as this. In this instance, however, they definitely embellish the work. These physico-chemical principles which have thrown light on many characteristics of protoplasm and many intricacies of function have been introduced where they aid precision, but have not been laboured to the point of wearying the biological student uncomfortable in the company of mathematical formulae.

Within the limitations of detail which the author has imposed upon himself the book is comprehensive and coherent, and offers a nicely balanced survey of a field whose borders touch the territories of many sciences.

NOTES ON BOOKS.

THE second number of *Antiquity*, a quarterly review of archaeology, edited by Mr. O. G. S. CRAWFORD, is as good as the first; in particular the standard of illustrations—so important a part of a publication of this kind—both in the text and on special paper, is well maintained. It contains an article by Professor A. H. Sayce, on the Aryan problem, with a subtitle "fifty years after"—after, that is, his early writings about the Aryans and the Hittites. A great many facts have been collected in the interval; Professor Sayce still hesitates to generalize, but he says that it has proved that there was "continuity of culture and trade, possibly also of language or race or both, between north-western India and the valley of the Euphrates at the very beginning of the Bronze Age." An article by Dr. E. A. Hooton, "Where did man originate?" is also wisely inconclusive, but he goes so far as to reject the theory of a central Asiatic area of dispersal for the protohuman stocks. The annual subscription, payable to Mr. Crawford, Nursling, Southampton, is £1. Separate numbers can be obtained from Mr. John Bellows, Gloucester, price 5s. 6d.

In preparing their book on the *First Principles of Chemistry*[6] DOOTSON and BERRY have evolved a scheme of presentation founded on their own appreciation of those principles. This is in contrast to many introductory textbooks which have been prepared on the plan of making an older book more modern by adding newer discoveries; such books usually have all the defects that result from putting new cloth upon an old garment. The authors of the book before us have recited the facts of chemistry and the reactions which typify general principles in appropriate connexion with their relation to modern theory. Our appreciation of the book is so high that it seems worth while to mention one or two of the few imperfections we have found. The formula $Na_2(SiO_3)_x$ (p. 42) is not correct, and may prove misleading. There can be no objection to writing $Na_2O(SiO_2)_x$, nor should there even be any prejudice against the expression CaO,SO_3 for $CaSO_4$ where it suits the context. We suggest, too, that the sentence (p. 184), "When boiled with caustic alkalis, sulphur passes into solution in the form of the metallic sulphide," might be enlarged to show that a part of the sulphur forms sulphide while another part enters into the composition of an oxy-acid, thus behaving like phosphorus, chlorine, and other non-metallic elements. The beginner who works conscientiously from this little volume will lay a sure foundation for all that he may afterwards need to build.

The nursing profession is already well supplied with textbooks on midwifery, but Professor THEOBALD has thought there would be room for a small volume entitled *Normal Midwifery for Midwives and Nurses*.[7] The book embodies a course of lectures given to the nurses at the Rotunda Hospital, and deals almost exclusively with the normal process of parturition. The main principle of the book is that midwives should understand clearly what is normal so that they may seek help in every case showing abnormality. He forbids them in any circumstances to make vaginal examinations, and urges the adoption of a rectal examination in the few cases where abdominal palpation does not lead to satisfactory diagnosis. Scant reference only is made to common abnormalities, such as breech and shoulder presentations. The author maintains that the nurse's duty ends when she has recognized that the case presents difficulty; but the country midwife ought to know the immediate treatment of the commoner complications pending the arrival of medical help, which may be delayed. In the management of the third stage of labour the nurse is advised to leave the uterus severely alone. To quote the author's words: "Think of the uterus as a thoroughly bad-tempered irritable old gentleman with gout." The chapter on asphyxia is somewhat misleading, for surely blue and white asphyxia are not essentially the same, nor is the treatment identical for the two varieties. A short chapter on aphorisms is included, but few are convincing. The author's ideal is to present a useful book on normal midwifery, but it is probable that fuller reference to the abnormal would be desirable; and, on the whole, the work is hardly adequate for a nurse desirous of following with intelligent interest all the cases which may come under her care.

Dr. I. FISCHER's monograph on gynaecology in Dioscorides and Pliny,[8] which is dedicated to the sixth international congress of the history of medicine recently held in Leyden and Amsterdam (see JOURNAL, August 20th, 1927, p. 317), is divided into two parts devoted to drug treatment in obstetrics and gynaecology respectively. In his introduction Dr. Fischer points out that these obstetrical and gynaecological writings consist merely of collections of drugs and are by no means textbooks. It would, indeed, be as difficult to form conclusions as to the condition of the gynaecology of that time as in the present day from a study of a general textbook on pharmacology. Both Dioscorides and Pliny quoted extensively from older authorities, but while Pliny was a conscientious if extremely credulous and superstitious layman, Dioscorides was a medical practitioner who has left a somewhat more critical and systematic work partly based on his own experience. Although there was an interval of more than four centuries between the Corpus Hippocraticum and the age of Dioscorides and Pliny gynaecology and obstetrics did not undergo any essential advance in the interval. The names of diseases were about the same, the symptoms were not more closely defined, and drug treatment followed the same lines in the first century A.D. as in the age of Hippocrates.

In *New Poems and a Preface*,[9] Mr. HERBERT MOORE PIM, who is not a member of the medical profession, contributes some "Hospital Lyrics" dated last year from the Cromer Cottage Hospital, and in a footnote appeals for more generous support than our hospitals now receive. In a number of smoothly phrased sonnets he pokes playful fun at the medical men who appear to have ventured to explore his chest, at the ways of matrons, and at the nurses who made his bed with more or less success. His gratitude is more outspoken to one specialty, for

> "Doctors may have a heart of stone,
> The Dentist's heart is like your own.
> In fact, he has such tender eyes
> He cannot hurt you if he tries."

The preface, dated this year from Kelling Sanatorium, Norfolk, deals in rather pathetic tones with the fate of poets.

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[5] *An Introduction to Physiological Chemistry.* By Meyer Bodansky, Ph.D. New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd. 1927. (Med. 8vo, pp. vii + 440; 44 figures. 20s. net.)

[6] *First Principles of Chemistry.* By F. W. Dootson, M.A., Sc.D., F.I.C., and A. J. Berry, M.A. London: Cambridge University Press. 1927. (5½ × 8, pp. vi + 339; 43 figures. 6s.)

[7] *Normal Midwifery for Midwives and Nurses.* By G. W. Theobald, M.D., B.Ch.Camb. Oxford Medical Publications. London: Milford, Oxford University Press. 1927. (Demy 8vo, pp. xx + 258; 28 figures. 10s. 6d. net.)

[8] *Die Gynäkologie bei Dioskurides und Plinius.* Von I. Fischer. Wien: Julius Springer. 1927. (6½ × 9½, pp. 36. R.M.2.)

[9] *New Poems and a Preface.* By Herbert Moore Pim. London: Burns Oates and Washbourne, Ltd. 1927. (Fcap. 8vo, pp. viii + 75; frontispiece. 6s.)

THE STATE OF THE PUBLIC HEALTH.

SIR GEORGE NEWMAN'S REPORT FOR 1926.

ENGLAND AND WALES.

[First Notice.]

IN his annual report, which has now been issued,[1] Sir George Newman deals with the state of the public health in England and Wales during 1926. The statistics on which it is based are the Registrar-General's returns relating to births, deaths, and infectious diseases, together with the various records in respect of invalidity obtained through the operation of the National Health Insurance Acts. Supplementary data have been derived from the reports of medical officers of health, and from investigations by medical officers of the Ministry of Health and other governmental departments concerned with the welfare of the people.

This year's report is appreciably larger than the previous one; it contains twelve chapters and four appendices. A prominent feature is the emphasis laid on the danger of drawing erroneous conclusions from statistics, particularly when the original returns cannot be regarded altogether without suspicion. When this primary information is incomplete or inaccurate the deductions drawn will have a similar character.

Registration of Causes of Death.

An example of this is furnished by the official recording of deaths, from which much information about the incidence of ill health is necessarily derived. The accuracy of death certificates and the findings of coroners' courts have consequently a collective importance which is not always fully recognized. Sir George Newman believes that the official records of mortality contain actual errors due to the omission of relevant information, either deliberately or because it was unobtainable. Thus he suggests that if the mileage of motor vehicles was known and taken into consideration it might be found that cars are *relatively* less dangerous year by year, though the absolute danger to life in this respect is increasing rapidly. Moreover, tabulation of these accidents by localities might reveal facts of considerable significance, and it is not stated what proportions of the victims were drivers, passengers, and pedestrians. In the case of deaths due to cancer of the liver and gall bladder there is often failure to intimate the primary site of the disease, and it is considered that when such an operation as complete removal of the breast for carcinoma has been performed and the patient dies subsequently of cancer elsewhere in the body, this previous event is sufficiently significant to require its being recorded on the death certificate. The omission of relevant information assumes a special importance in the case of deaths attributable to alcoholism, and Sir George Newman devotes attention to this obvious cause of false deductions. He compares unfavourably the present system of open certification with the practice in Switzerland, where the certificate is a confidential document, and the friends of a deceased person have no access to the statement of causes of death. He does not suppose that the records in this country are thereby absolutely vitiated, and thinks that the conclusions drawn annually as to the decline in intemperance are probably substantially sound; but he believes that there would be a considerable extension of knowledge as regards the real toll taken of human life by the intemperate use of alcohol if death certificates became confidential documents. Similarly the sensational index afforded by the number of children suffocated in bed or "overlaid" by adults is open to suspicion when used as evidence of alcoholism; other factors might conceivably become more prominent if greater care were exercised in certification. Sir George Newman also draws attention finally to the unsatisfactory term "status lymphaticus," and, in a careful examination of the problems concerned, describes its employment since 1911, when it was first used as a heading in the publications of the Registrar-General. He insists that the basing of a diagnosis on the weight of the thymus is unscientific, owing to the marked variability of this gland; nor, in the present state of knowledge, can the histological appearance be used safely as a criterion. He believes that status lymphaticus is a mere verbalism, and that the current textbook teaching on the subject is erroneous; he goes so far as to use the terms "medical mythology" and "obscurantism" in this connexion. He concludes that it is urgently necessary to ensure correct registration of the cause of death since, apart from social and legal issues, it supports the fabric and art of preventive medicine. Sir George Newman's careful examination of this question will draw attention anew to the provisions of the Births and Deaths Registration Act, 1926, which came into force last July, and it may be recalled that some account of the reforms introduced, particularly in respect of death certification, appeared in our issue of June 18th (p. 1118).

Births and Deaths.

The birth rate has again declined, the fall in 1926 being 0.5 per 1,000 of the population as compared with the rate in 1925, and 7.7 under that for 1920, which marked the climax of the temporary rise in the birth rate following demobilization. The death rate similarly fell, being 0.6 per 1,000 less than in the previous year; it is now approaching the rate in 1923 (11.6), which is the lowest on record. A slight upward trend in the mortality rate is expected to occur soon; this is believed to be inevitable owing to the change in distribution of the age groups, for a declining birth rate implies an increase in the average of the population. It will not necessarily indicate any strengthening of the conditions favouring mortality.

The following causes of death were prominent during 1926, the figures in each case being the proportion in 1,000 deaths: diseases of the heart and circulatory system, 188; bronchitis, pneumonia, and other respiratory conditions excluding tuberculosis, 150; malignant diseases, 117; affections of the nervous system, 103; and all forms of tuberculosis, 82. Increases were recorded in the deaths from diphtheria, cancer, and diseases of the heart, but these were more than counterbalanced by a decline in the deaths from influenza, pneumonia, bronchitis, and the diseases of early infancy. The reduction in the infantile death rate affected mainly the age-period 3 to 12 months; the mortality under the age of 4 weeks still remains relatively high. Whooping-cough was a serious factor, but there was a decline in the number of deaths from influenza. The low level of infant mortality in 1926 may be reckoned as the equivalent of the saving of some 40,000 infant lives. It also implies that the physical condition of children between the age of 1 to 5 years has improved, and that hygiene, both personal and public, is better. The mortality among women in childbirth remains high; in 1926 2,860 women died, puerperal fever accounting for as many as 1,109.

Small-pox.

In 1926 in England and Wales 10,141 cases of small-pox occurred as compared with 5,354 in 1925, 3,797 in 1924, and 2,504 in 1923. The disease was for the most part mild in character and confined to the northern parts of the country. The 5,354 cases of small-pox in 1925 were scattered through twenty-two counties, only fourteen being so affected in 1926; those with the highest incidence were Durham (6,645 cases), the West Riding of Yorkshire (1,215), Derbyshire (582), and Northumberland (843). The disproportionate prevalence in Durham is attributed to the operation of various factors; thus there were repeated invasions of the disease from Northumberland, two districts were backward in taking active measures to limit the spread of infection, and it was difficult to obtain an adequate number of beds for isolating the patients. Reference is made to the outbreaks in London and the Willesden urban district to indicate how easily the infection of small-pox may be introduced into England. Sir George Newman comments tersely: "It must be said, quite plainly, that the facts and figures recorded above indicate an increasing tendency to small-pox, and the English people must make up their minds whether they prefer small-pox to vaccination." He adds elsewhere in the report that in the world generally the incidence was low in 1926, the only European countries in which more than 100 cases were reported during the year being

[1] *On the State of the Public Health.* Annual Report of the Chief Medical Officer of the Ministry of Health for the year 1926. H.M. Stationery Office. (Med. 8vo, pp. 281. 3s. net.)

England, France, Italy, Spain, Portugal, and Russia. There was, however, increased prevalence in Egypt and Algeria, and an epidemic with over 2,100 deaths at Rio de Janeiro, while 957 cases with 171 deaths occurred between January 1st and May 15th, 1926, at Los Angeles.

Various Infectious Diseases.

During 1926 were notified 2,739 cases of enteric (including paratyphoid fever) as compared with 2,779 in the previous year, 4,121 in 1924, and 3,211 in 1923. Scarlet fever cases fell to 81,672 from 91,362 in 1925. Sir George Newman expresses the hope that the early administration of scarlatinal antitoxin serum in suitable cases will reduce materially the period of detention in hospital of these patients. There were 51,069 cases of diphtheria notified in England and Wales during 1926, with 2,994 deaths, as compared with 47,720 cases in 1925, and 41,080 in 1924. The warning is given that immunization is too often postponed unduly until an epidemic occurs; full protection cannot then be assured, owing to the fact that the condition of immunity requires at least two or three months for its development. The diphtheria death rate increased slightly from 0.071 per 1,000 population in 1925 to 0.077 for the year under review. Until the end of 1926 there was no evidence of influenza being of particular importance statistically, but in the first week of January, 1927, an epidemic began in London and moved slowly northwards. Sir George Newman gives an account of this epidemic, and concludes that the recrudescence of influenza was rather more serious than the outbreak in 1924, but less so than that of 1922. In age distribution and general type its features were those of the prepandemic period rather than of 1918-19. There was an associated increase in pneumonic notifications. Two locally contracted cases of bubonic plague occurred in Liverpool in 1926, but the cause was not traced. One case of typhus of unknown origin was detected in Sunderland.

Acute Poliomyelitis.

Special consideration is given to acute poliomyelitis in view of its increased prevalence during 1926, when 1,159 cases were reported with 176 deaths. The outbreaks since 1897 in various parts of the country are tabulated. In 1926 the disease began its epidemic phase in the middle of July, and continued till the end of the year, extending through the mild winter, including the first two months of 1927. The disease was particularly prevalent in Essex, Kent, and the Midlands, but the cases were not very numerous in the most populous areas, and in London the incidence was relatively slight. The infection usually involved small groups of population in rural districts. Details are given of the outbreaks in Leicestershire, Essex, and Kent. It is concluded that there is at present no evidence to incriminate the milk supply in this connexion. No social predilections were shown by the disease, and it appears that the home conditions were not so concerned in its spread as they are in other contagions. Clear evidence of contact transmission was obtained in two outbreaks, and it seems to be established that the infection may be conveyed by persons suffering from acute typical attacks, or from the mild and atypical forms; it may also be spread by healthy persons who have come into contact with the disease without being affected by it, or by chronic carriers who have apparently recovered fully. The infectivity in acute cases is greatest during the early stages of the malady. The possibility of transmission by insects, food, dust, or sewage seems to be remote, and human contact remains the chief, if not the sole, probable means of spread. The general evidence points to an incubation period of four to five days, though shorter and also much longer intervals have been recorded. Details are given of the clinical manifestations, the diagnostic criteria, and the prevention and treatment of the disease. Sir George Newman concludes that infection is probably widespread in a community during an epidemic, but that only a small proportion of susceptibles are attacked. He emphasizes the importance of early diagnosis, and of providing institutions equipped to give special treatment with a view to preventing muscular weakness or permanent deformity.

(*To be continued.*)

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

ANNUAL MEETING IN LEEDS.

THE annual meeting of the British Association for the Advancement of Science, which was founded ninety-seven years ago, began in Leeds last week, when Sir Arthur Keith, M.D., F.R.S., Conservator of the Museum of the Royal College of Surgeons of England, succeeded the Prince of Wales in the presidential chair. The Prince, who was still in Canada at the time of the meeting, sent a message in which he recalled that in his address at Oxford last year he had dealt with the relations between science and the State. The choice of this topic had, he thought, been justified by the proceedings of the Imperial and Colonial conferences, which both laid emphasis upon the value of scientific research in relation to imperial development, and both set up special committees on research. Such events put it beyond doubt that one of the main objects of the British Association was in process of achievement—namely, that of "obtaining more general attention for the objects of science." The Prince then referred to the splendid generosity of Sir Alfred Yarrow in making a gift of £10,000 for the general purposes of the Association, to be expended in the course of twenty years. In conclusion, the Prince said that he could whole-heartedly congratulate the Association on its choice of his successor, for Sir Arthur Keith's name stood very high in the science of man's origin and early biological history.

Before Sir Arthur Keith began his address he read out a letter of thanks to the Prince of Wales, in which, also, stress was laid on the inspiring message the Prince had given at Oxford to the Association, and through it to men of science throughout the Empire. His appeal had already borne fruit. Closer union between men of science overseas and their colleagues at home in their endeavour to solve problems of imperial concern was within sight.

The President then delivered his address, which is printed at page 439. In acknowledging at its conclusion a vote of thanks, which was given with great enthusiasm, Sir Arthur Keith announced that the Council of the British Association was considering the advisability of purchasing for the nation the home and surroundings in which Charles Darwin worked, and which were thus the cradle of ideas that had transformed the outlook of man.

THE SECTIONS.

The British Association publishes at the time of its annual meeting a *Journal of Scientific Transactions* which not only serves as an agenda paper of the various meetings, but also gives concise abstracts of many of the papers. The publication is of interest also as affording some idea of the all-embracing scope of science. From the nucleus of the earth to infinite space there is hardly a phenomenon of the universe that escapes its scrutiny. The appeal is, naturally, to the man of science, but the ordinary citizen, in these strenuous and somewhat perilous times, cannot be indifferent to such subjects as, for example, mental stress and the psychology of accidents.

HUMAN PHYSIOLOGY: ITS STUDY AND TEACHING.

Taking for the subject of his presidential address the development of human physiology, Dr. C. G. Douglas, F.R.S. (Oxford), sought to place before the members of the Section of Physiology a picture of the real task of physiology—namely, the study of the phenomena which characterize normal life as shown in the individual organism. Bearing this definition in mind, it was clear that the very great advance in knowledge which had been made in the last fifty years did but take us to the threshold of the subject; investigation had been analytical, the organism had been treated as consisting of more or less independent systems—circulatory, respiratory, and other—which were separately investigated in detachment, as it were, from the individual organism and studied apart from their normal setting. Moreover, the discoveries, with some exceptions, had been made in animals by experimental methods, and often under the influence of anaesthetics—

that is to say, not under normal conditions, but under the pathological conditions of traumatism and intoxication. Invaluable as the information reaped from these researches had been, it did not meet the demands of the definition, nor give the full answer that we required. In a few instances the experimental procedure had been of a nature not to interfere with the regular bodily functions of the animal; this was so, for example, in Pavlov's researches on the digestive juices and those of Rubner on nutrition and energy liberation. Apart from these exceptional instances, however, it could hardly be denied that the traditional methods had their limitations, and Dr. Douglas contended that in the study of normal physiology man himself was in many instances a far more advantageous subject for investigation than were the lower animals. In support of this contention he adduced several instances in which valuable information had been reaped from investigations on the human subject, and he claimed that for gaining any adequate conception of what is really implied by life, the method could be replaced by no other.

The history of the development of our ideas about respiration afforded, he said, a striking example of the value of human physiology. The researches of Haldane and Priestley by this method had shown that the activity of the respiratory centre depended on its sensitiveness to the concentration of CO_2 in the blood—a trifling rise causing hyperpnoea, a trifling fall causing reduction or cessation of breathing. It became evident that the activity of the respiratory centre was proportional to the mass of CO_2 produced in the body and carried to the lungs, and this in turn implied that the quantitative correlation of the ventilation of the lungs with changes of metabolism in the body as a whole was ensured by chemical means. From this work we gained our first insight into the amazing delicacy of true chemical correlation within the organism. It was subsequently recognized that the respiratory centre was sensitive not to CO_2 as such, but to changes in the H-ion concentration of the blood, and that lactic acid accumulation resulting from muscular activity had to be taken into account. Having grasped the fact that breathing was automatically adjusted to tissue metabolism, it became obvious that the delicate adjustment of the breathing in conformity with the various changes in the activity of the different tissues and organs would be valueless without an equally delicate co-ordination of the circulation, since on this depended the transport of gases between the tissues and the lungs.

To ascertain the full facts of the regulation of the circulation and its adaptation to the varying needs of the body was a more difficult problem than the regulation of breathing; but a beginning had been made. Methods had been developed for determining the circulation rate in man, for measuring the variations in the amount of blood expelled from the heart under different conditions of bodily activity, the extent of the changes in gas content of the venous blood entering the lungs, and the relative part played by alterations in the pulse rate and in the systolic discharge at each beat. These and other researches referred to by the lecturer showed something of the part that human physiology had already played in the study of vital phenomena. The evidence of balanced interaction of the functions of the different organs with the preservation of the functional integrity of the whole, which was so convincingly brought home to us in experiments on the human subject, had made us appreciate the fact that for the comprehension of life it was the normal human organism which should be regarded as our physiological unit.

Finally Dr. Douglas expressed the opinion that the teaching of physiology would be more satisfactory if human physiology occupied a more prominent position, not so much as regards advanced teaching, but in the course taken up by the majority of students who had a medical career in view. So far as elementary practical physiology was concerned, as distinct from biochemistry, reliance was still placed largely upon an experimental treatment of the rudimentary phenomena exhibited by amphibian muscle and nerve, and there seemed little doubt that a serious attempt to incorporate, even in elementary courses, experiments in human physiology would be amply justified in its results.

MENTAL DISSOCIATION.

Dr. WILLIAM BROWN, the President of the Section of Psychology, gave an address on mental unity and mental dissociation. Its substance may be stated as follows: Considered in its most general aspect, man's mind was a unity—one, and indivisible. So too with regard to its function; in the broadest sense mind had but one fundamental function—a purposeful striving toward a definite equilibrium, the colour of which was satisfaction. But, like all other things, mind had undergone development from the simple to the complex; in its varied experience it had employed partial activities to aid and favour the attainment of its one fundamental objective, and its structure had been moulded, without being divided, to subserve these partial ends. Mind, therefore, although one, was not homogeneous, but exhibited structure, and presented itself as an association of partial activities developed by varied moulding of a single originally homogeneous substratum. As the mind could, by association, combine partial activities to its advantage, so also it could reject partial activities which, in changing circumstances, opposed its fundamental aim. This dissociation was a normal, not a pathological, process of the mind—a process, not of annihilation, for the mind could not obliterate the structural modification upon which the partial activity had depended, but one of reduction to mere potentiality, and degradation from participation in the practical affairs of life. Since the structural modification remained, circumstances might revive the potential partial activity into actuality. It might be supposed that if a complex group of such potential activities was suddenly brought into play, and if at the same time the corresponding normal, but contrasting, group was degraded, the individual would exhibit, not a division of the mind, but a new personality. Instances of alternating personality of this kind were well known, and it was in such cases that the pathology of dissociation could be detected. It was not that dissociation was in itself an abnormal process—the contrary was the case—but that in these instances it was incomplete; a tendency which was repressed was, as it were, rejected and accepted at the same time—rejected by clear consciousness, but still clung to by the mind.

Dissociation as a normal process might, however, be abnormal in its incidence, just as the contraction of the arterioles, although a useful function, might be inconvenient if untimely. The dissociation, instead of suppressing an undesirable activity, might affect a part of the normal mental processes and put out of action an essential element in the normal working of the mind. Cases of shell shock afforded examples of this, a forgetfulness of the events immediately succeeding the catastrophe indicating the loss of a partial mental activity. The unity of the mind was not destroyed, but its adaptation to the changing circumstances of existence was impaired; the physical phenomena associated with the shock, such as tremors, mutism and paralysis, which would pass away under the influence of an intact mind, were severed from their psychical counterpart—fear—and became fixed. While treating cases of shell shock in France, Dr. Brown found that a large proportion showed a more or less extensive amnesia for events that had occurred immediately after the explosion. These patients were easily hypnotized, and under a light hypnosis the lost memories could easily be restored; and he found that if at the same time the terrifying emotion were also recalled, the accompanying physical symptoms disappeared spontaneously. This result he explained in terms of a theory of reassociation (BRITISH MEDICAL JOURNAL, June 14th, 1919); by re-arousing the whole of the lost experience in all its emotional vividness the physical manifestations became linked up with their psychical counterpart, the mind became resynthesized, and the physical symptoms, coming once more under the sway of the entire mind, could disappear.

LIGATURE OF THE VAS DEFERENS.

In the Section of Zoology the committee (Dr. F. A. E. Crew, Mr. J. T. Cunningham, and Professor J. S. Huxley) for the experimental investigation of the effects of vaso-

ligation, cryptorchidism, grafting, etc., on the seminal tubules and interstitial tissue of the testes of mammals, presented a further report. The right vas deferens was ligatured, in the cat, in two places, and a piece between the ligatures cut out. The animal was killed 104 days after the operation. The end of the vas next to the operated testis was found to be closed and the spermatic blood vessels uninjured. Abundant active sperms were obtained from the epididymis of the non-operated testis, and the operated testis showed perfectly normal spermatogenesis. The epididymis of the operated side was distended with semen, its diameter being twice the normal. Experiments on ligation of the vasa efferentia were carried out on the rat. They showed that closure of the lumina of the vasa efferentia caused complete disorganization of the seminal epithelium in six days. As the operation involved no interference with the circulation of blood in the testis, it was evident that the effect was to be attributed to increase of pressure within the tubules. It followed, therefore, that if the vas deferens only were ligatured the absence of injurious effect was due to the fact that the great space contained in the long coiled tube of the epididymis prevented this increase of pressure in the seminal tubules; the epididymis acted as a reservoir for the semen and became greatly distended in consequence.

The conclusion drawn was that when the distension and pressure increased to a certain point within the epididymis, absorption of semen was increased, an equilibrium was reached, and no further rise of pressure occurred. In one experiment, in the rat, the membrane through which the vasa efferentia pass was ligatured on the left side, and the right testis was detached from the scrotum and fixed to the abdominal wall by a ligature passing through the gubernaculum. The animal was killed after sixteen days, when the right testis was found to be atrophied, being only about half the normal size, and its seminal epithelium was completely disorganized. The left testis was functional and the ligature loose.

Mental Stress and the Psychology of Accidents.

In a paper read to the Section of Physiology Dr. R. J. S. McDowall, Professor of Physiology, King's College, London, maintained that the general effect of mental stress was associated with increased sympathetic activity; there is an increased rate of the heart and vasomotor tone, which together bring about a great elevation of blood pressure. Further, there is definite evidence that alimentary activity in general is diminished, as shown in the reduction in salivary and gastric secretion and the marked delay in the emptying of the stomach. Such conditions may, Professor McDowall suggests, be largely responsible for many alimentary ailments and, in part, also for undue strain on the circulation. With regard to accident causation, Mr. F. Farmer, in a paper read to the Section of Psychology, said that it had been shown that the distribution of industrial accidents among individuals exposed to the same risk was not such as can be explained by chance. The typical curve of accident distribution exhibited special features, which seemed to point to the conclusion that each person had a given degree of accident proneness which would determine to a large extent the number of accidents he would sustain in a given period of exposure. This conclusion was reached as the result of certain sensory-motor tests of the rapidity and accuracy of visual, auditory, and tactual reactions.

First Recorded Case of Colour-Blindness.

In the same Section Dr. Edridge-Green claimed that the celebrated physicist Robert Boyle was the first to record a case of colour-blindness. Two cases came under Boyle's notice, concerning one of which, a girl of 18, he writes, in 1688, that

"she can distinguish some Colours, as Black and White, but is not able to distinguish others, especially Red and Green: And when I brought her a Bag of a fine and glossie Red, with Tufts of Sky-Coloured Silk; she looked attentively upon it, but told me, that to her it did not seem Red, but of another Colour, which one would guess by her Description to be a Dark or Dirty one: and the Tufts of Silk that were finely Colour'd, she took in her Hand, and told me they seemed to be a Light-colour, but could not tell me which; only she compar'd it to the Colour of the Silken Stuff of the Lac'd Petticoat of a Lady that brought her to me; and indeed the Blews were very much alike. And when I asked her, whether in the Evenings, when she went abroad to walk in the Fields, which she much delighted to do, the Meadows did not appear to her Cloathed in Green? She told me they did not, but seemed to be of an odd Darkish colour; and added, that when she had a mind to gather Violets, tho' she kneel'd in that Place where they grew, she was not able to distinguish them by the Colour from the neighbouring Grass, but only by the Shape or by feeling them."

Some years previously this girl had lost her sight, which gradually returned, with the exception of the colour sense.

Amœboid Movements.

Mr. C. F. A. Pantin contributed to the Section of Zoology some observations on amœboid movements. As these were, he said, independent of permanently differentiated contractile structures, the theory had been advanced that they were due to a lowering of the surface tension at one spot. Microscopical dissection and other evidence showed that this view was untenable and that the movement was associated with the ready changes of state of the protoplasm from a fluid "sol" to a contractile "gel" and vice versa. The changes were easily observed in the Limax type of amœba, in which each particle of protoplasm underwent a more or less rhythmic change of state from sol to gel.

The Fertility of the Sea.

Mr. H. W. Hervey reported to the same Section some ingenious observations on the fertility of the sea. Its animal life was, he pointed out, ultimately dependent on minute plants, which in their turn were dependent on the supply of phosphates and nitrates in the water. Such salts were in general abundant in the deep water of the open ocean, but absent from the surface, where alone the presence of light rendered vegetable life possible. Where, however, currents brought the deep water to the surface, there minute organisms were abundant, giving the water a greenish hue, contrasting with the deep blue of the barren areas of the ocean. Around our coasts the cooling of the surface in winter caused mixing with the warmer layers below, and, plant life being scarce at that season, the salts arising from the decay of dead organisms accumulated. In spring a rich outburst of diatoms utilized these salts, while in late summer a second outburst of plant life occurred, utilizing the salts regenerated from the corpses of the spring and early summer growth.

Head Hunters.

In the Section of Anthropology among several papers of interest was one by Dr. J. P. Hutton on the savage custom of head hunting. A recent authoritative work on Borneo traces the custom to a desire for human hair as an ornament or for human beings to accompany the dead in the next world. Dr. Hutton satisfied himself that in Assam it had a different significance, for it appeared to be connected with a belief in the fertilizing powers of the dead—for the soil, for stock, and for the human population. To assist these fertilizing powers, phallic stones were erected as symbolic abiding-places for the soul, and similar stones were intimately connected with head hunting.

Education of Uncivilized Races.

In the Educational Section Mr. Rivers Smith made some interesting observations on the educational policy which appears to have been officially adopted for tropical Africa. The best results, he considered, were to be looked for by the adaptation to the demands of civilized societies of what can be retained of native social systems, and by endeavouring to promote the growth of the new order through a natural process of evolution, rather than by an undue insistence on Western systems. Care, he urged, should be exercised not to destroy a good African by the inoculation of ideas and tastes which could not find expression in an African community. The aim should be to produce a new but finer conception of the African rather than a spurious imitation of the European.

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SATURDAY, SEPTEMBER 10TH, 1927.

DARWINISM AND THE ASCENT OF MAN.

THE President of the British Association for the Advancement of Science stands in the position of an ambassador called to speak for Science in the Court of the World, and this year at Leeds the honourable responsibility has fallen to Sir Arthur Keith. He has interpreted his duty in a characteristic way by saying, on behalf of the whole body of scientific workers, that the future of thought is being built on the foundations that Darwin so securely laid. In this connexion it is interesting to look into the work of the thirteen sections of the British Association, and no one who does this seriously can fail to realize that Darwin's mind has fundamentally affected the main lines of work of nine or ten. Sir Arthur Keith refers to Darwin's wise generalship in giving twenty-two years, at least, to preparing to launch his main contribution to science; we now know that those years were not spent in hatching the idea; we have in printed form the preliminary sketch written as Darwin began to ponder over his masterpiece. But Darwin was not only a master artist who saw into Nature as few others have done, he was also humble and patient enough to collect details and check them, and to adjust his ideas to new light from fresh facts. Sir Arthur Keith did not concern himself with the details of the picture of evolution as painted by Darwin or as elaborated by constructive criticisms and, at times, obscured by verbal subtleties since his day. Darwin's main plea for the survival of some and the elimination of other variations in the struggle for the life of the individual and the group is still held to be of great importance, and we are beginning to perceive somewhat dimly how all sorts of reactions between organism and environment are influences for change.

The advance in our knowledge of the process of evolution since Darwin's day has not been so marked as might have been hoped; there have been too few who could even aspire to bend the bow of Ulysses. The trend of thought has rather been in the direction of following out the idea of evolution in the phenomena of growth and health and disease, in the study of social organizations the world over, in theory and practice of education, ancient and modern, in economics and psychology, in poetry, and deep down into the innermost recesses of philosophy and religion. The great influence is still unfolding its power, and it is well that Sir Arthur Keith should stand forth in his high position to make a simple statement, to tell the plain truth—that there is no part of the study of life and thought that can be built up for the future, save on the basis which was crystallized out from the work of hundreds of researchers by the synthetic imagination of Darwin and Wallace, and their humble patience in collecting a unique store of artillery for the controversy ere it was launched.

It has been natural for vested interests in the field of thought and for some indolent persons to listen to details of criticism of Darwin's work, which has necessarily been modified especially by advances of physiological research, and some of them have thought that the idea of evolution was fading, that the clear view had gone. Sir Arthur Keith has the support of all scientific workers in proclaiming that the idea of evolution is as yet young, and that some cherished opinions may need deep modification, however much casuistic subtleties may delay and prolong crises and turn men's thoughts from the essentials. Some of Darwin's friends and successors in their controversial agitation had little peace of mind in which to build up for themselves a picture in proper perspective; we need rather to leave controversy alone now our representative has repeated the fundamental message. If we are wise enough to do this, we may hope to work towards an enrichment of the picture of the evolutionary processes that some bellicose politicians have so misapprehended.

The idea of evolution is treated by Sir Arthur Keith in its connexion with man, and his modesty has prevented him from enlarging upon several points which would have brought in his own work and his own views. He thinks that our pithecoid ancestor inhabited the tropical or subtropical forests of Miocene times, and emphasizes the value of the work of Pilgrim and of Gregory on the apes of that time, of whom, unfortunately, only teeth and jaw fragments have been found. Since that distant epoch we and our anthropoid ape-relatives have diverged, one towards the warm forests the other apparently towards more temperate lands. But the divergence has not gone so far as to obscure relationship, and Sir Arthur Keith pays his tribute to the work of Professor G. H. Nuttall on the similarity of blood reactions between apes and ourselves, and of Professor Elliot Smith on the human brain. The difference even in the latter is only a difference in proportions; the human brain contains no formation that is not in the ape's brain. The President, however, from his long studies of ancient skulls, sees clearly that we have not an orderly file of stages from ape to man; some skeletons are very man-like in certain features and very ape-like in others, and he illustrated this difficulty most aptly by a reference to the recent, but fortunately closed, controversy as to whether the—on the whole—very human skull and, the very ape-like jaw at Piltdown could belong to the same type. It is now practically universally agreed that they did.

To unravel man's pedigree we have, Sir Arthur Keith said, to thread our way not along an orderly line, but through the meshes of a complicated network. By this he means that the ancient skeletons which we know are all to some extent departures from the main human stem in some feature or another, and we have to infer from one and another what the common ancestor was like. We could have wished that, from the President's long studies of growth, it had been deemed appropriate to include in the address some illustrations of the concept that differences in growth make adults aberrant, and that it is not necessary to suppose that any adult ever showed just the whole assemblage of characters which we conceive of as ancestral. The young are more akin to one another, and Sir Arthur Keith rightly pressed home the idea that the study of experimental embryology is one of the great hopes of the future. So far as man is concerned, embryological observation—extended well into the period of post-natal growth and bringing in all that can be gathered about the influence of thyroid, pituitary, and other endocrine secretions on the basis of Sir Edward Sharpey-Schafer's great work—is likely to be of immense importance for the advancement of knowledge. Since man has come into existence

the levels of land have changed, climatic zones have moved, deserts have spread, and with all these changes have gone alterations in growth that need to be worked out in far greater detail than has hitherto been possible. When more has been done in the way of the combined study of man and his environment, we shall see better how it comes about that the adults of related stocks differ from one another so much more than do their young, we shall have an idea of the influence of growth changes in promoting evolution of types, and we may even glimpse some understanding of the mystery of the transmission of new characters of growth to the germs of future generations.

We may interpret Sir Arthur Keith's message to the world as a clear statement that the positions won by Darwin are definitively held, and that the field is clear for a great advance in the understanding of the evolution of man by synthetic work, gathering in the facts that geographers, anatomists and physiologists, sociologists, and psychologists place at the disposal of the Science of Man.

RESTORING THE DISABLED.

THE end of the great war left every combatant nation with a number of damaged individuals on its hands, for whose care and relief it felt itself responsible. Certain nations realized in addition that the average standard of health of their members, as shown by the examination of recruits, was much too low. Never before had the entire young adult manhood of the English-speaking nations come under thorough and skilled inspection. The result in this country gave a severe shock to our complacency, and "Are we a C3 nation?" became a familiar question in our newspapers. But we have had so many other troubles in the last eight years that perhaps our attention has wandered a little from the question of the improvement of the physical fitness of our people. In the United States, however, the question of rehabilitation, as it is called, has not been allowed to slide into the background of domestic politics, but has been earnestly discussed by a number of social workers and medical men. The United States has only so comparatively recently changed from a nation preponderantly agricultural and pastoral in its occupations to one that is increasingly urban and industrial that it was natural for the average American to assume that the physical development of his fellow citizens was as good as that of the "embattled farmers" of Emerson's poem and the days of Washington. It was to him collectively a great surprise to find that the enforcement of the draft showed how many townsmen were physically unfit, and he is not disposed to accept this depreciatory report without making strong efforts to improve matters.

As this unfitness was generally the result of the maladies and unwholesome conditions of childhood and youth, as well as of adult life, the adequate treatment of acute and chronic disease in all its stages assumed a position of great importance, and rehabilitation has come to connote the making good of the organism damaged by the diseases of peace as well as by the effects of warfare. Among the States which have seriously gone into the matter that of New York is conspicuous, and the New York Academy of Medicine has taken the lead in investigating the facts of the situation as regards the care and management of convalescent homes. One outcome of these inquiries takes the form of a report of the Public Health Committee, which consists largely of epitomes of reports by subcommittees on the convalescence of surgical, medical, neurological, and pediatric cases respectively.[1] The authors of these elaborate reports, among whom is Dr. Frederic Brush, the medical director of the Burke Foundation at White Plains, New York, seem to have considered all aspects of the question, including provision for the treatment of cases which are not strictly convalescent but chronic, and also those cases of poor health which by treatment in a country institution may be saved from the breakdown which seems imminent and might otherwise be inevitable. Dr. Brush uses the name of "preventoria" for proposed institutions intended for the care of such patients, and he states that over 30 per cent. of the 6,000 patients treated yearly at the Burke Foundation are in the "preventive" class. The need of continuity of treatment and the establishment of liaison between the general hospital and the convalescent home is insisted upon, for it appears that in the United States it is not usual, as it is in London, for the hospitals to maintain their own convalescent institutions. About 300,000 to 400,000 patients were cared for last year in the United States in convalescent homes, and of these cases, if the experience at White Plains may be taken as typical, some 25 per cent. would be more properly called chronic than convalescent. Dr. Brush expresses some of the most important of his conclusions in these words: "Every community of upwards of 200,000 people should have one large general convalescent hospital serving the community, open to all, receptive to the man that walks in off the street, to the private doctor, and the employer—not alone to the hospitals and health organizations. It is not that the large places can be run at less cost per day—a prevalent fallacy. It is because of the superior convalescent therapy that is inherent in the larger grouping. Also special convalescent homes are needed. They may be small and established for heart disease first, the neuro-mental borderlines, rheumatism, special dieting, etc."[2]

We have not yet in this country inquired into the needs and origins, or formulated our requirements with such thoroughness as has been done in New York, but we may hope that as far as convalescents are concerned we have provided and shall continue to provide for them adequately. The organizers of our charitable efforts might well consider the pleas put forward in America for a widening of the field of institutional treatment. In all or nearly all of the States throughout the Union, organizations have sprung up whose object is to restore the disabled worker to health, or at least to a condition of wage-earning capacity. At the beginning of this year a monthly journal called *The Rehabilitation Review*[3] was established under the editorship-in-chief of Dr. Fred H. Allbee, whose work in the treatment of disease of bones and joints is well known, and having for managing editor Mr. Frederic G. Elton. The advisory editorial staff of nearly ninety, on which Canada and nearly every state of the Union are represented, includes also nine names of European surgeons and physicians widely known in connexion with medical as well as surgical rehabilitation. If such a publication succeeds, as it should, in enlisting the sympathies and interests of workers in rehabilitation generally, it

[1] Institutional Convalescence. Standards for the Care and Management of Convalescent Homes. A Report of the Public Health Committee of the New York Academy of Medicine. Reprinted by the Sturgis Reserve Fund of the Burke Foundation.

[2] The Essentials for Convalescent and Sub-Standard Health Care. By Frederic Brush, M.D., Medica. Director, The Burke Foundation for Convalescents, White Plains, New York. Reprinted from Hospital Social Service, XV. 1927, 396.

[3] *The Rehabilitation Review.* Devoted to the Restoration and Employment of the Disabled. Representing the National Organizations Interested in the Welfare of the Disabled. 30, East 23rd Street, New York.

should become a most valuable and beneficent power, not only in America, but in all the civilized world; but there seems some risk of its straying from its proper field of action and trenching on the domains of active surgery or medicine. In the three numbers that have reached us there are articles describing in detail surgical operations for the relief of the disabilities produced by poliomyelitis, and on the treatment of fractures, which, excellent in themselves, would be more appropriately published in the pages of a special or general medical or surgical journal. We offer in all friendliness the suggestion that similar contributions should not in future be admitted, lest their presence should alienate the interest of the many non-medical workers in rehabilitation.

HEALTH OF BRITISH TROOPS IN CHINA.

THE latest reports from China show that the health of the troops continues very satisfactory in spite of the difficulties attendant on the confinement of a large body of troops within a small space in a town like Shanghai. Dysentery has been almost entirely absent, and no case of cholera has occurred among the troops. There have been a number of cases of malaria, but the majority of these were relapsed cases contracted in India. Cases of pneumonia have continued to occur through the summer months. There has been a small outbreak of enteric fever among the men of the 1st Battalion Middlesex Regiment at Wei-hai-Wei. The first case occurred on July 14th, and by July 29th fifteen cases had been admitted to hospital, but no further cases have since been notified. The source of infection is uncertain. Venereal disease has been a difficult problem from the time of arrival of the troops in the Far East, but the incidence appears to be declining. Ample hospital accommodation exists both in North and South China, and a convalescent depot of 400 beds has been established at Wei-hai-Wei for troops from Shanghai and Hong-Kong during the hot weather. The local medical and public health authorities have rendered much valuable assistance. The Canadian Department of Soldiers' Civil Re-establishment has very kindly provided accommodation in its hospital at Vancouver, B.C., and patients requiring long convalescence or subsequent evacuation to England are being sent there. The journey home through the monsoon during the hot weather is thus avoided.

CHARLES DARWIN'S HOUSE.

IN our article this week (p. 459) on the annual meeting of the British Association at Leeds brief reference is made to the announcement by the President, Sir Arthur Keith, regarding the proposal to purchase for the nation the home and surroundings in Kent where Charles Darwin lived for forty years. The appeal for funds with which to acquire this historic house has now resulted in a munificent offer from a member of our profession, Mr. George Buxton Browne, F.R.C.S., of Wimpole Street, London, who retired from practice some years ago. Downe House (or Down, as it used to be spelt) stands in a retired corner, about sixteen miles from London, between the high roads to Westerham and Sevenoaks. In 1842, when Darwin bought it and made it his home for life, a long coach drive was the only means of access. Of these quiet surroundings, in which so much of his epoch-making work was done, Darwin wrote: "My life goes on like clockwork, and I am fixed on the spot where I shall end it." He made a number of additions and alterations to the house and grounds, and died there on April 19th, 1882. Mr. Buxton Browne's motive in offering to make himself wholly responsible for buying the estate and establishing a fund for its upkeep is to permit future generations to visit Darwin's home. The General Committee of the British Association on September 6th authorized its President to accept with gratitude this offer. It is understood that the donor has expressed a wish that Downe House, within and without, should be restored, so far as is now possible, to its condition in 1882, and that some appropriate medical man of slender means should be appointed resident custodian. All Darwin's preliminary study for *The Origin of Species*, as well as the writing of that book and *The Descent of Man*, took place at Downe. It is intimately associated, therefore, with the greatest works of the great naturalist.

NEW INSURANCE DRUG FUND REGULATIONS.

DRAFT regulations amending the National Health Insurance Medical Benefit Regulations in so far as payments to pharmacists are concerned have now been issued by the Minister of Health. They are in accord with the proposals set out in a recent circular, on which we commented in a leading article in the JOURNAL of August 20th last (p. 315). In that article we noted a curious proposal whereby Insurance Committees might, if so advised, reserve up to one-tenth of their Chemists' Fund for special distribution to those chemists who had been continuously for specified periods of time on the lists of those supplying drugs and appliances to insured persons. The draft regulations now provide that where a portion of the fund is so appropriated the Committee "shall increase the sums payable to those persons in respect of the year to which the Chemists' Fund relates in proportion to the accounts submitted by them and passed by the Committee in respect of that year." So far no explanation has been given of the purpose of this novel provision, nor of the circumstances in which it may be expected to be put into effect. It will be interesting to ascertain or to observe these, inasmuch as it is conceivable that corresponding conditions might be held to arise in connexion with the Practitioners' Fund. A further draft regulation directs the Insurance Committees to furnish returns of the "capitation fees and other sums paid by them to insurance practitioners in respect of the supply of drugs and appliances to insured persons." This is with a view to the Minister ascertaining the yearly balance left in the Medical Benefit Fund after these and the other necessary payments have been made, the whole of which balance has, under the new conditions, to be handed over to the chemists. One important point must at once be raised with regard to this on behalf of dispensing practitioners. It will be remembered that, prior to the present calendar year, the dispensing capitation fee for practitioners was 2s. The Insurance Acts Committee put forward a claim, which it considered fully justified, for 2s. 6d. The Ministry, in a letter dated October 9th, 1926, offered an increase to 2s. 3d. as from January 1st, 1927, and the Conference of Representatives of Local Medical and Panel Committees, with some reluctance, resolved "That the offer of 2s. 3d. be accepted as the best under the circumstances." The new regulations bring about a radical alteration in the circumstances, and this will clearly justify the Insurance Acts Committee or the annual conference next month in reopening this question if, on the merits of the case, they consider it desirable to do so. It will be the more necessary to consider this if any proposal be made—as it may be—to agree that no further alteration of the Medical Benefit Regulations shall be made for a definite period of time. Because dispensing practitioners decided to forego their full claim on whatever balance there might be in the fund under the then conditions it does not follow that they would be willing to forego it if the effect is merely to add to the sum distributable among the chemists. It would be

interesting to know what one penny on the dispensing capitation fee of practitioners represents per insured person on the sum distributable to pharmacists.

TELEGRAPHISTS' CRAMP.

TELEGRAPHISTS' cramp forms the subject of a report by Miss May Smith, Dr. Millais Culpin, and Mr. Eric Farmer to the Industrial Fatigue Research Board. Though it does not appear to record any notable advance in the prevention of this disorder it is possible that the tests devised by the investigators may be of use in any further work which aims at assisting vocational selection amongst would-be entrants to the telegraph services. This is the view taken by Professor Greenwood in a statistical note appended to the report. The observers found that telegraphic work makes more exacting demands than allied occupations, and that these demands affect the emotional rather than the intellectual life. Consequently a majority of the "cramp" subjects examined had psycho-neurotic symptoms, commonly allied to muscular weakness. Though in many cases muscular tests did not differentiate the subjects from normal people, tests applied to young learners of the age of 16 showed that it was possible to distinguish those with psycho-neurotic symptoms from those of more stable development; but only 100 learners were examined. Six of these had sufficiently acute symptoms to admit of classification in recognized groups of psychoneurosis. Eleven others approximated to the type of the majority of sufferers from cramp, and were afflicted with psycho-neurotic symptoms and weak muscular co-ordination. Fifty-four showed no such predisposition; and twenty-seven were slightly unstable. The report seems to suggest that the 20 per cent. who had psycho-neurotic symptoms would have nervous breakdowns in some other occupations also, but would be very liable to "cramp" in telegraphy. At the same time they might be efficient at some other occupation, where their emotional make-up did not receive constant stimulation in the work. The investigations indicate, perhaps, that little can be done at the moment, except to leave the selection of entrants to the telegraphic service to those who are at present responsible. Doubtless these authorities succeed in eliminating at all events a portion of the 20 per cent. of psycho-neurotics, whereas the method of selection reached by Dr. Culpin and Miss Smith would exclude such a proportion of post-office workers as to lead Professor Greenwood to describe it as very drastic. It is interesting to note that in America, where telegraphy is not a permanent occupation, telegraphists' cramp is hardly recognized as a disease.

THE BIBLIOGRAPHY OF CANCER.

FOR some years past the French anticancer league has published, as a supplement to its bulletin, a number of abstracts of papers on cancer from current literature. It now proposes to institute a more complete analysis in the form of a quarterly fasciculus, under the title of *Index Analyticus Cancerologiae*. It is intended, as announced in the first fasciculus, to give a classified list of the titles of all papers relating to cancerous disease which appear in the periodicals and publications of the entire world, together with a summary of the contents of such as appear to call for special notice. It is calculated that the annual volume will comprise about 600 pages containing some 2,500 references. The present fasciculus contains nearly 600 references, and there are one or two summaries on every page. Where authors have given summaries in their papers, these are to be reproduced word for word in the abstracts. The undertaking is naturally one of great magnitude and can only be brought to completion gradually, but the hope is expressed that it will have an international character. With regard to organization, it is proposed to establish national committees to collect material from the respective countries. The members of the French committee, already constituted, are Borrel, de Nobèle, Hartmann, Regaud, and Roussy, with Lacassagne as general secretary; and similar committees have been appointed for Germany, Belgium, Denmark, Spain, Holland, Norway, Sweden, and the U.S.S.R.; it is hoped that other nations will join the scheme. The material collected by the national committees will be transmitted to the French editorial committee, and the whole will serve, without other alteration than the translation of the titles and analyses, for editions in different languages. A somewhat similar project has already been undertaken in this country under the direction of the Council of the British Empire Cancer Campaign. A strong committee was formed, of which the late Sir William Leishman was chairman, and a review started with the title of *The Cancer Review*, the first number of which appeared last year. The ideal aimed at was to give an abstract of every important publication bearing upon the problems of cancer research. Thus the scope is more limited than that of the French project, and no attempt is made to include the titles of every paper published on the subject. Fifteen numbers of the review have now been issued, and it cannot fail to be considered excellent in every respect. As is well known, the term "abstract" is very elastic; sometimes it refers merely to a brief statement of what a paper is about, and may give little more information than the title; at other times it aims at giving a concise account of the contents of the paper, and in its best and most useful form serves almost as a substitute for the original article. *The Cancer Review* appears to favour the latter type of abstract; it requires skill and a considerable amount of space, but there is an evident intention to be unstinting in both. Of the necessity in these days for good works of this kind there is no need to speak.

INCOME TAX: THE THREE YEARS' AVERAGE.

SECTION 29 of the Finance Act, 1926, which comes into operation for the first time this year, substitutes the basis of the previous year for that of the previous three years. In so doing it fulfils one of the recommendations of the Royal Commission on the Income Tax, and incorporates a modification suggested by that Commission with a view to the avoidance of hardship. If the option is to be exercised the election to adopt the three years' average must be notified to the local officials—in practice to the inspector of taxes—not later than October 5th, 1927; this date is to be carefully noted. It will be opportune, therefore, to give a brief account of the conditions and limitations of the option. The assumption underlying the provision is that where profits have increased more or less steadily no hardship is involved in the change of basis, but where, in consequence of the change, the profits of unusually bad years are excluded from the calculation, then some special concession is due, because those poor years have not yet had an adequate effect on the taxpayer's liability. An example may make this point clearer. Suppose that a practitioner who ordinarily earned £1,200 a year for some reason earned only £600 in 1925; then up to and including the financial year 1925-26 he will have paid tax on an assessment of £1,200, and for 1926-27 on 1/3 of (£1,200 + £1,200 + £600 =) £3,000—that is, on £1,000; and if he is assessed for subsequent years on his earnings for the previous year, he is left in the position of having paid on £400 more than he has earned. The statute therefore provides what may be called a test of hardship, and the test laid down is whether or not the amount of the average profits for the six years 1918 to 1923, inclusive,

exceeds *either* of the profits for 1924 or 1925; if it does, then the person or firm to be assessed can elect to adopt the three years' average for 1927-28 and 1928-29. It should be borne in mind that the election applies to both years and not to either separately. The exercise of the option calls for some judgement, because so far as 1928-29 is concerned the balance of advantage turns to some extent on the amount of the profits for 1927, which, of course, are not now ascertainable—though they may be capable of a reasonable estimate—unless the end of the practice year precedes October 5th, whereas, in fact, it is usually December 31st. It will frequently happen that the individual or group of individuals owning a particular practice in 1927-28 will not be identical with those owning the same practice throughout the six years 1918 to 1923. The point is dealt with in the statute, but cannot be fully explained in a brief note. In effect, if at least one individual has been the owner or a part-owner throughout the whole period, then the comparison is made as if there had been complete identity; on the other hand, if there has been a complete change in ownership, then the periods in which none of the existing owners were proprietors of that practice have to be excluded from the years 1918 to 1923, and an average taken of the earnings of the remainder of those years.

THE NATIONAL INSTITUTE FOR THE BLIND.

THE report of the National Institute for the Blind for the year 1926-27 gives an account of the work of the largest institution for the blind in the world. It is becoming more and more the co-ordinating agency of the numerous small local blind aid societies throughout the country; it is through it that for many purposes various statutory authorities assist the blind; it helps the blind by relief and training, in finding employment, and in organizing the marketing of their handiwork. For these reasons alone it would be worthy of all sympathy and assistance. But these aspects of its work are not the greatest features of its activities. Perhaps that which is the most helpful is its action as the greatest publishing agency for the blind. Embossed books in Braille and Moon types are prepared and printed by the Institute for the whole Empire. During the year under review nearly 400,000 publications were issued, and ten periodicals—including two newspapers, a literary review, a popular monthly, and monthlies devoted to juvenile literature, music, massage, and religious subjects. The latest innovation is the *Braille Radio Times*, of which 1,500 copies are now sold weekly. Wireless broadcasting has been an inestimable boon to the blind, and the new journal gives them information about the programmes and as to how to keep their instruments in order. The books published for the blind include classical as well as modern works, and the students' library which is maintained has been described as "a library of books unobtainable from other libraries." Nearly 800 new volumes for students have been prepared by hand by volunteer Braille writers during the year, and the total of books now in this library is 5,000, valued at £11,000. A new machine is being designed whereby it will be possible to reproduce from an original Braille manuscript a number of copies. It is a marvel of ingenuity; the paper sheets from the writer, when inserted in the machine, act as selectors, allowing small plungers to rise by means of compressed air. There are nearly 4,000 of these plungers, so the delicacy of the apparatus may be imagined. The work of the Institute in the foundation and maintenance of homes for blind babies, "Sunshine Houses," is too well known to require more than mention. But greater than this is its work at Chorley Wood College for Girls with Little or No Sight; it is a fine piece of work, and we are pleased to note that the College has been recognized by the Board of Education. The work of the Institute is controlled by an executive committee. The names of its members are given, with a "Who's Who." We note that Dr. Brackenbury, the Chairman of Council of the British Medical Association, is now a member representing the Association of Education Committees; Mr. Bishop Harman is the advisory ophthalmic surgeon to the Institute. The report contains a clear financial statement of the Institute and its subsidiary departments, prepared as prescribed by the Ministry of Health and the Board of Education. Last year, owing to the general depression caused by the severe industrial crisis, there was a decline in funds of £15,000. How can the Institute be helped? The answer is given in the report. Perhaps the most valuable form of assistance is the annual subscription. The total amount of annual subscriptions received should be the basis of the funds upon which the Institute can calculate in respect of maintenance and extension of activities. The head office is at 224, Great Portland Street, London, W.1.

MEMORIAL TO THE LATE DR. J. G. ADAMI.

IN view of the personal popularity and scientific eminence of the late Dr. J. G. Adami, F.R.S., it is fitting that a memorial should be established in the University of Liverpool, to which, as Vice-Chancellor, he devoted himself with such energy and enthusiasm in his later years. It has been suggested that the most appropriate form for a memorial to take would be the creation of an Adami Fellowship in Pathology; for this the sum of £3,000 would be required. There must be very many old students, friends, and admirers, both in Montreal and Great Britain, who would wish to associate themselves with this tribute, and their co-operation is earnestly invited. An alternative and less ambitious proposal is the endowment of an Adami Library of Pathology in connexion with the Medical Library. Donations to the Adami Memorial Fund may be sent either to the Treasurer or Registrar of the University of Liverpool, or to Heywood's Branch of the Bank of Liverpool and Martins, Limited.

NEW REGULATION FOR EDINBURGH M.D. DEGREE.

Correction.

IN our last issue—the annual Educational Number of the BRITISH MEDICAL JOURNAL—we printed at page 417 a paragraph on the new regulation for the examination for the M.D. degree of the University of Edinburgh. This repeated almost word for word the information already given in our issue of April 2nd, 1927 (p. 639). We regret to learn that its appearance in the Educational Number under the general heading "Degrees for Practitioners" has caused misapprehension among practitioners who are not Edinburgh graduates. We are officially informed that the new regulation referred to is simply a change in the nature of the clinical examination for the degree. The M.D.Ed. degree is, now as hitherto, conferred only on graduates of the University of Edinburgh. We hasten to correct the wrong impression thus inadvertently conveyed.

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS.

WE publish in the SUPPLEMENT this week (p. 126), at the request of the Registrar of the General Medical Council, a list of the names of those medical practitioners who have not replied to his inquiries as to the accuracy of their postal addresses. Any practitioner who finds his or her name included in this list should communicate at once with the Registrar of the General Medical Council, 44, Hallam Street, Portland Place, London, W.1.

Ireland.

MEDICAL COUNCIL (FREE STATE).

THE result of the voting for the election of two direct representatives of the medical profession to the Free State Medical Registration Council established under the Medical Practitioners Act, 1927, was as follows: Dr. Maurice Hayes, 1,141 votes; Dr. R. J. Rowlette, 926; Dr. P. E. Hayden, 552. Dr. Hayes and Dr. Rowlette were declared elected.

ROYAL MEDICAL BENEVOLENT FUND SOCIETY.

At meetings of the Central Committee of the Royal Medical Benevolent Fund Society of Ireland, held in the Royal College of Surgeons, Dublin, during July and August, the following grants were made:

Medical man, aged 33, in hospital suffering from pulmonary tuberculosis. £30 special grant.
Applicant, aged 40, in reduced circumstances. £15 special grant.
Applicant, aged 75, income £26 per annum from charities and old age pension. £20.
Medical man, aged 65, incapacitated through blindness; income 10s. a week. £50 special grant.
Widow, aged 50; nine children, six dependent; income about £200 per annum. £30 special grant.
Widow, aged 57, health broken; took in lodgers while she was able. £30 special grant.
Widow, aged 70, income from old age pension and £26 gift from friend. £20.
Widow, aged 35, left suddenly destitute through accidental death of husband; four children under 8 years of age. £60 special grant.
One application was refused.

FERMANAGH COUNTY HOSPITAL.

The report of the Fermanagh County Hospital for the last year is, when all branches of its work be considered, of a more encouraging nature than previous issues. The medical side is decidedly satisfactory, and the hospital is self-supporting to the extent of 44 per cent. of its expenditure, the County Council providing the other 56 per cent. The total income was £5,840 13s. 3d. It is to be regretted that the committee had to close one ward of eight beds for want of funds. There is, perhaps in consequence, a small waiting list for admission on the male side, and it became necessary to refuse some cases, such as tuberculosis of the spine, which might occupy beds for many months. There is a sum of £675 due still to the hospital by the County Council, and if this were paid the governing committee could provide *x*-ray apparatus, which is badly needed, and for which the electric wiring connexion has already been provided. The total income from dividends (bequests and gifts) is £148 13s. 10d. yearly; the late Mr. C. Wilson, registrar of the hospital, contributed the sum of £1,027 10s. 8d. There was a considerable increase in donations, but this excellent institution requires all the help it can receive to maintain it in a state of efficiency.

Scotland.

PRESERVATIVES IN FOOD.

THE Scottish Board of Health has issued a memorandum dealing with preservatives in certain articles of food, as amended by the regulations of December, 1926, and July, 1927. The memorandum directs local authorities and officers of Customs and Excise to enforce the regulations, and authorizes them to enter premises where articles to which the regulations apply are prepared, packed, labelled, or sorted, with the object of taking samples, for which they are authorized to make reasonable payment. It is forbidden to add any form of preservative to meat except that sausages and mince are allowed to contain not more than 450 parts per million of sulphur dioxide. Sulphur dioxide (including sulphites) may also be added to fruit pulp, dried fruit, jam, sugar, beer, cider, and wines, and benzoic acid is permissible in unfermented wine, ginger-beer, pickles, and sauces. Among the colouring matters prohibited are compounds of antimony, arsenic, cadmium, chromium, copper, mercury, lead, and zinc, also gamboge and picric acid. When articles of food contain preservatives these must bear a label of prescribed form stating that preservative is present.

SCOTTISH ASYLUMS PATHOLOGICAL SCHEME.

The thirtieth annual report of the Board of the Scottish Asylums for the year 1926 gives an account by Dr. Reynolds, the pathologist, of the work done during the year. The laboratory is now accommodated in the university buildings, where facilities for the work are provided at the expense of Edinburgh University. The expenses of the research and reporting are provided by subscriptions from twenty-one institutions, and amounted to a revenue of £1,687 in 1926. A research has been undertaken into "The paths of infection to the brain meninges and venous blood sinuses from neighbouring peripheral foci of inflammation." Research in regard to neuroglia was also commenced; various lectures to students and graduates had also been given by the pathologist. As regards routine reporting work, 127 reports had been sent out to various asylums dealing with bacteriology, Wassermann's reaction, chemical examination of the cerebro-spinal fluid, and histology. The expenditure had been £1,037.

MONTROSE ROYAL ASYLUM.

The annual report of the Royal Asylum of Montrose for the year ending May 15th, 1927, shows that the number of cases under treatment during the year was 861, the number discharged being 64. Of these, 46 left the institution as recovered, 6 as relieved, and 12 as not improved, while the number of deaths was 74. The daily average number resident was 746, of whom 720 were certified and 26 voluntary patients. The average age on admission was 49 years, an increase of almost four years on the average of the past five years. Seven cases were under 20 years of age, and 25, or 17.7 per cent., were over 70, 5 of them being over 85 years of age. Forty cases had suffered from at least one previous attack. With regard to causes assigned for the mental breakdown, hereditary predisposition was ascertained in almost one-third of the admissions. Over 70 per cent. suffered from general weakness, malnutrition, or active physical disease. As the patient gained in strength a corresponding mental improvement was found. Fourteen patients suffered from congenital defect, of whom 4 were also epileptic. Four cases were general paralytics, but it is noted that the incidence of this disease has greatly diminished during recent years. Fifteen cases were recorded of mania, 30 of melancholia, and 4 of alternating insanity. The number of patients discharged was 74, of whom 46, including 19 men and 27 women, had recovered. The recovery rate, calculated on a number of admissions, was 32.6 per cent. The death rate, calculated on the average number of residents, was 10.2 per cent., the average age at death being 60.4 years. With regard to voluntary patients, 26, or 39 per cent. of the total private admissions, came under this heading. Of these 11 were discharged recovered, making a recovery rate of 42.3, which compared favourably with the 32.6 per cent. in the certified cases.

England and Wales.

HOME AMBULANCE SERVICE.

AT the end of June the Home Service Ambulance Committee of the Order of St. John and the British Red Cross Society had 319 ambulances and 54 affiliated stations; four new ambulance stations were equipped during the June quarter. The number of patients carried during that quarter was 21,154 in the home service ambulances, and 7,572 in the affiliated ambulances. Altogether since its establishment the number of cases carried exceeds half a million. The liaison officer, Major Paget, in the course of a recent tour, visited many ambulance stations, and reported that there was evidence of an increased desire to make the service of invalid transport as nearly perfect as possible. At station after station he found proof of the generous spirit in which members of the Order and of the

Society spent themselves in the service of the sick and injured. He noted with particular satisfaction the care taken to keep the inside of the ambulances in good order, to provide clean and well aired blankets and pillows, and to make arrangements for first-aid appliances, hot-water bottles, and other accessories. An ambulance, of course, does not last for ever, and an increasing number of stations are setting themselves to get the best type possible when the time comes for replacement. Special attention is directed to a new ambulance recently taken into use at Aylesbury; every detail, from the stretcher carriers to the door hinges, has been carefully considered by the officer in charge, Superintendent P. Marshall. The Home Service Ambulance Committee is taking an active part in the organization of the road service scheme for bringing first aid to the victims of traffic accidents. The lines on which this work is developing vary, according to local stations, from a full service, including roadside tents equipped for first-aid treatment, with an ambulance at hand and patrols on the road, to simpler but useful arrangements by which stretchers or first-aid appliances can be readily obtained at convenient points.

MANCHESTER POST-GRADUATE COURSE.

The customary post-graduate lectures given at the Manchester Royal Infirmary will begin on Tuesday, September 27th. They take place on Tuesday and Friday afternoons, commencing at 4.15, and provide an opportunity for practitioners in the district to obtain information about recent advances in medicine and surgery. These lectures have been given regularly since the war, and the attendance is satisfactory, though it is thought that more practitioners in the immediate neighbourhood might take advantage of them, for they offer very valuable facilities. The Tuesday lectures are delivered by the active honorary staff of the hospital, the Friday lectures are largely given by other members of the Infirmary and University staff. Dr. J. Gray Clegg will speak on the field of vision and on the microscopy of the living eye; Dr. E. M. Brockbank on Dr. Percival and Dr. Ferriar in their relation to public health problems in Lancashire; Dr. Veitch Clark, the medical officer of health of Manchester, on immunization against diphtheria and scarlet fever; and Dr. A. D. Macdonald, of the physiological staff of the University, on the causation of shock.

The Lloyd Roberts Lecture in Manchester will be given this year by Dr. Hector Charles Cameron at St. Mary's Hospital, Whitworth Street, on November 1st. His subject is "The child in general practice; a study both of temperament and disease."

THE PUBLIC AND CANCER.

It is a common practice nowadays to furnish the public with information on the subject of cancer, although there is, unfortunately, little to be gained at present from the knowledge imparted except emphasis on the importance of earlier or more frequent visits to the doctor. Dr. A. G. Anderson (M.O.H., Rochdale) has provided his council with a rather more complete summary than usual of our knowledge, or lack of knowledge, of this disease. The passages from his report for 1926 have been published as a pamphlet. After discussing the etiology of cancer, and mentioning the indications research affords of the possibilities of prevention, Dr. Anderson summarizes facts under this head which he thinks the public ought to know. After stating that the incidence of cancer is rising rapidly, and that during the last fifteen years the mortality has been increasing more rapidly amongst men than women, he goes on to urge that diagnosis and treatment must not be delayed, that an attitude of fear, despair, or fatalism must not be allowed, and that the early pre-cancerous danger signals must be watched for. The danger signals enumerated by Dr. Anderson cover so large a field that the average man may be disposed to disregard them. Though it may be difficult to induce the man in the street to read and comprehend the pamphlet, it may be hoped that an impression will be made by the optimism of the final statement—that by early treatment one-third of all male cancers, and one-half of all female cancers can be cured, and that "the present high cancer mortality ought to be, and could be, reduced by nearly 50 per cent."

ARTIFICIAL SUNLIGHT TREATMENT OF FEEBLE CHILDREN.

The medical officer of health of Huddersfield (Dr. S. G. Moore) has made a report on the open-air residential treatment of under-average children at the Cinderella Holiday Home, Honley. It gives an account of an interesting experiment in the treatment of these children with artificial sunlight. There were sixty-two children resident. During the past winter the children were separated into two groups, matched in pairs as far as possible, and to one group was given ultra-violet treatment, to the other group none. Both received equal benefits in good housing, good clothing, and good food. The children on admission were undernourished and anaemic. All improved substantially. The results of the experiment are apparently discongruous. Increase in haemoglobin and in red cells "is in favour of those who received the treatment compared with those who did not; 6.7 per cent. contrasting with 8.182 per cent. of the former, and 58,600 contrasting with nearly 400,000 of the latter." On the other hand the boys who did not have the light treatment gained on an average 4 lb. 2.8 oz. in weight as against 3 lb. 8.364 oz. of those receiving the treatment. The latter gained more in height and less in chest measurement. With the girls there were similar results. It is noted that on admission many of the children were suffering from enlarged veins of the trunk, which is regarded as evidence of subnormal respiratory function, and that this defect was greatly improved on discharge.

Correspondence.

THE EPIDEMIOLOGY OF POLIOMYELITIS.

SIR,—In a paper upon the epidemiology of poliomyelitis (August 27th, 1927, p. 347), Dr. Walshe calls particular attention to certain suggestions which I have made in connexion with the mode of spread by carriers and brands me as the author of a series of preposterous statements, in the heat of his argument, which compel my immediate repudiation; further, he accuses me—I am sure quite unwittingly—of falsifying Dr. Reece's figures in an allusion to the Stoke Rivers incident in the Devon and Cornwall outbreak of 1911, for the purposes of furthering my argument. I have suggested that a "carrier" epidemic preceding and working up in virulence to an epidemic of disease might possibly explain the multitudinous recorded instances in which poliomyelitis has suddenly appeared simultaneously in a number of widely separated localities. Let me quote Dr. Reece's words in connexion with the outbreak above mentioned:

> "Poliomyelitis was dispersed all over both counties (Devon and Cornwall) in a short space of time, and apparently the appearance of the disease in many widely separated parts was almost simultaneous, so that it could not have been explained by abortive cases unless these had been present in very large numbers."

I have never used the word "simultaneous" in connexion with the subject of poliomyelitis except in relation to appearance of the disease in widely separated localities. Yet Dr. Walshe accuses me of the statement that

> "the presence of this army of carriers leads to the practically simultaneous mass infection of all available susceptible subjects. . . . This manner of spread involves the universal and simultaneous striking down of all susceptible members of the community."

I have never made any such statement, nor can any such interpretation of anything which I have ever said or written be justly arrived at. The absurdity is overwhelming in the light of every recorded epidemic.

Dr. Walshe becomes incomprehensible when he makes me responsible for the "categorical statement . . . that at the moment of infection the virus ceases to be infective, thus rendering case-to-case spread impossible." I have argued that the carrier is the chief means by which the disease is spread. Is not the carrier infected? Is not every case of poliomyelitis of necessity a carrier during the incubation period, since this is a nasopharyngeal infection and readily communicable by droplet infection? What I have said to explain the absence of any proved infectivity from poliomyelitis in the pyrexial stage and thereafter is that the infectivity of the virus wanes very rapidly when the bodily

reaction to the disease appears, and in so doing I am in accord with a general principle by which infectious disease is recovered from. For example, measles is provedly intensely infectious at the moment of appearance of the first symptom, and probably for some time before that. Thereafter the infectivity rapidly declines. Dr. Walshe will not be able to dismiss my denial of proved case-to-case infection so summarily or easily as by referring to the infection of monkeys from a case of poliomyelitis of ten days' duration as readily as from a carrier, since the injection of the virus into the central nervous system, which is the means by which monkeys are usually (and with great difficulty) infected, is not the means by which poliomyelitis is transmitted in the human subject, and is no proof of the possibility of nasopharyngeal infection with a virus of the same strength.

The classic Trästena event reported by Wickman—referred to by Dr. Walshe—does not in reality support his argument. It proves that six of the fifteen houses infected from the school were infected by a carrier who did not subsequently develop the disease, and does not in any way disprove that the other nine houses were infected by carriers who did thereafter develop the disease, even though Dr. Walshe should deny the evidence of Kling and Pettersen, who record that they proved at least two carriers for every developed case of the disease in the infected households that they examined.

The advent of the disease upon one member after another in the same household with a definite period between the onset of each case does not disprove that the infection occurred from the one to the other in the carrier or incubation stage, and it does not prove the infectivity of the developed disease.

Dr. Walshe comments upon my short reference to the Stoke Rivers outbreak, "a swift scourge which, lighting upon the little village of Stoke Rivers, laid low in a few days 45 persons out of a total population of 119," as so out of harmony with the facts as to lend no support to my theory, and he proceeds to state that there were but 36 cases, and that the epidemic lasted forty days. I referred to this outbreak as of historic interest, and never used it in support of any theory. My veracity as to the numbers is supported by the wording of Dr. Reece's report:

> "In this community of 119 persons there were thirty-six attacks by poliomyelitis, which were more or less definite. . . . In addition to the thirty-six there were nine others who may possibly have suffered in a minor degree."

Dr. Walshe seems to object very much to my description of the curve of incidence in time of cases of poliomyelitis during an epidemic as having characteristically a rapid blaze, high peak, and rapid fall. Surely this type of curve has been recorded much more often than any other and may be termed justly the most characteristic. The slowly rising and slowly falling flat-topped curves of the lowly incident epidemics of large towns, which I have referred to the "salting" of the community, are, of course, well known.

Any mention which I have made of immunity following epidemic poliomyelitis has no reference to any personal experience, for in England we have not had successive epidemics incident upon the same community, but it is gathered from the record of the American epidemics, that an epidemic seemed to remove all the susceptibles, and in a second epidemic incident upon the same community only those born subsequently to the first epidemic were affected.

When Dr. Walshe states that during the last twenty years children admitted to hospital suffering from poliomyelitis in the pyrexial stage have been treated with the precautions usual in infective disease, and that their opportunities of spreading infection are restricted in consequence, and uses this argument against my contention that cases of acute pyrexial poliomyelitis have repeatedly been admitted to the children's wards of our hospitals, and that no case of spread of infection has ever been recorded, he is surely on very unsafe ground, for at no hospital at which I have served, nor at any London hospital at which I have been able to inquire since the appearance of his paper, nor at the hospital where Dr. Walshe and I are colleagues, have any such precautions been taken, and for the reason that experience has never called for them.

The case for the carrier epidemic and the carrier infection has not fallen to the ground, and remains entirely sound in spite of this recent argument. Moreover, it is in keeping with the trend of recent epidemiological research. The argument for case-to-case infection from the developed disease needs only the one indisputable case to prove it, and that case is not yet forthcoming.

I cannot think that any speculation upon disease nor suggestions which may explain its strange manners, made in the light of clinical experience and with a knowledge of the literature, will have any of the dire effects Dr. Walshe warns his readers against.—I am, etc.,

London, W.1, Aug. 30th. JAMES COLLIER.

ALCOHOL AND THE MOTORIST.

SIR,—Allow me to pay my tribute of admiration to the valuable scientific work of Dr. Godfrey Carter, Dr. Southgate, Professor Mellanby, Widmark, Miles, and others, in their efforts to elucidate the problems involved in "alcohol and the driver."

The method of approach along specialized lines is extremely interesting to the police surgeon, but for practical purposes we must surely take a broad view of the clinical signs that justify the diagnosis of drunkenness with the corresponding unfitness to drive. The borderline cases are naturally those of greatest difficulty. In the preliminary stage of intoxication—call it exuberance or hilarity—the man is liable to consider his judgement best, and, in fact, to take unnecessary risks. Frequently associated with this "superior" judgement there is a reckless will power, coupled with an unsteady mechanism for carrying that power into effect.

The definition of a good driver may well be put thus: One who gets a grip of approaching danger in an instant, and who has the skill and the power to avoid it. A rapid reaction time is, perhaps, one of his most valuable possessions. Undoubtedly alcohol delays this reaction time, but the degree of interference is not constant and knows no law.

If we admit the pathological condition to be one of damaged association fibres, physiological and psychological, with delayed reflexes, we are even then confronted by the fact that these paralyses, partial and temporary though they be, do not travel *pari passu* in any one individual. It is well to have a list of tests available and to be continually on the lookout for fresh signs and for fresh tests, but in my experience the man himself discloses in his own story the way in which the alcohol has affected him, and so affords clear indications for the surgeon's examination.

Not by the quantity of alcohol excreted by any one organ, but by his behaviour, and the manner of his driving, should a man, in my opinion, be judged—always providing the surgeon sees him soon after the accident and pronounces him drunk.

Justice would be assisted if the surgeon were permitted to re-examine the man the following morning.—I am, etc.,

J. MAUGHAN, M.B.Lond.,

August 30th. Surgeon, S Division, Metropolitan Police.

SIR,—I have read with interest the leading article in your issue of August 27th (p. 354) in which you gave appreciative consideration to my paper at the Edinburgh Meeting, on the alcoholic urinary concentration as a guide to intoxication. But though appreciative in the main, it is critical in detail. May I, therefore, be permitted to draw attention to one or two matters in debate?

I need not emphasize the paramount importance of the general clinical examination of the person concerned, to which every care must be given. Upon its completion a written statement is required from the doctor giving his diagnosis. This statement is produced in all subsequent legal proceedings. The analytical tests can only follow later, and confirm, or fail to confirm, what has been written, and these tests have likewise to be stated in court. It follows that the alcoholic urinary analysis is of greatest value in "borderline cases," and it is in these instances that I most frequently make use of it.

You comment upon the possible illegality of the proceeding. I do not think there is any illegality, and Lord Russell, who presided over our discussion in Edinburgh, was of my opinion. I contend that we have as much right to examine the urine as the breath, or pulse, or reflexes. Indeed, I examine for sugar and albumin at the same time, and might be adversely criticized in court if I did not, as a recent case of which I lately read testifies. The other point is the well known difference in the behaviour of comparative abstainers and topers who have recently consumed alcohol. Mellanby and Southgate have shown that in the case of the latter there is delayed absorption. They do not readily become drunk and they fail to exhibit a high alcoholic blood content. As they do not become drunk they are not apprehended for being drunk, and consequently do not concern us in this issue. But if, by chance (as recently happened in two of my cases), after a "night out" they do show signs of intoxication, then a high alcoholic urinary concentration will be found. In other words drunkenness will appear in the abstainer and the toper in accordance with how much alcohol is present in the blood (and consequently the urine) at the material time. We are not concerned in any way with how much alcohol a person has consumed. All that signifies is "Is he drunk?" If his blood alcoholic content be high he will inevitably show signs of intoxication, toper or abstainer, whether little or much drink has been needed to produce that effect.—I am, etc.,

Sheffield, Aug. 31st. GODFREY CARTER.

GOITRE REMEDIES.

SIR,—Your New Zealand correspondent (August 27th, p. 361) seems to take the new health regulations in that country rather seriously. It seems "that iodized salt can safely be used for household purposes, and its use is authorized in breadmaking." As iodized salt only contains 1 grain of potassium iodide, or more likely 1 grain of sodium iodide, in 35 lb. of salt, the dose of iodide is fairly homoeopathic. Moreover, it does not seem to be evenly distributed, as I have never been able to find a trace of iodine under ordinary methods of analysis; in fact, it seems to be as elusive as a vitamin. The sodium chloride is all right, and it is an excellent table salt, but I would not pay a fancy price for it in the idea that I was being dosed with iodine. It would be perfectly safe in the hands of those misguided physicians who prescribe iodine and thyroid in exophthalmic goitre. For ordinary goitre allopathic doses are requisite.

In a paper in the *Practitioner*, April, 1914, on the functions of the thyroid, the suprarenal and the pituitary glands, I recorded two cases of exophthalmic goitre caused by large doses of tincture of iodine, and rapidly cured by the substitution of a calcium salt for the iodine.

Youths up to the age of puberty frequently suffer from defective action of the thyroid, and in such cases I have long recommended a large piece of solid iodine, say 2 drachms, to be placed in an open cup in the dormitory. This slowly volatilizes into the atmosphere which the patient breathes at night, but usually additional small doses of iodine or an iodide are requisite.

There are very few diseases more easily prevented and cured than the different varieties of goitre. I have never seen a death from exophthalmic goitre since I ceased recommending surgery about a quarter of a century ago.—I am, etc.,

London, S.W.7, Aug. 27th. JAMES BARR.

SALARIES OF TEACHING APPOINTMENTS.

SIR,—In recent numbers of the JOURNAL the post of surgical tutor which the University of Leeds desires to fill has been refused advertisement and is put on the "black list" on the ground, I believe, that the salary offered is £500 instead of the £600 which the Association's scale requires. May I suggest that the Association is not acting in the best interests of the progress of medicine when it tries to extend the policy which has succeeded so admirably in professional appointments to the sphere of university education, with which it is not concerned?

The advantages which are open to a young graduate holding a junior teaching appointment in a university are enormous; he has the opportunity of devoting himself wholeheartedly for two or three years to learning his subject in a real way and gaining a unique equipment for whatever line he selects to take up for life. For such post-graduate education I think sometimes payment might be asked instead of given. It is, however, necessary for even the most earnest students to live, and universities offer a great number of small appointments which enable young men and women to do that in decency if not in comfort. It is quite impossible for them to pay at the rate which the Association (I dare say quite rightly) demands for professional as distinct from educational services, nor would it, I think, be right for them to do so. Those who hold these appointments get at least as much as they give, and the only consequence of the action which the Association is attempting will be to diminish the number of young medical graduates who can take advantage of the splendid educational opportunities which are offered to them.—I am, etc.,

Radlett, Herts, Aug. 18th. A. E. BOYCOTT.

MEDICAL CONFIDENCES.

SIR,—Dr. Gemmell (August 20th, p. 329) seems to hold the view that priests who hear confessions could give valuable evidence in legal trials, and that they are exempted from being called upon to break faith with their penitents because they are more determined in their resistance than are doctors.

The difference in treatment is better explained possibly by the difference in value of priests and doctors respectively as witnesses. A doctor is a much more valuable witness than a priest would be. His evidence consists chiefly of his observations and opinions, whereas a priest can say only what has been told to him.

Further, there can seldom be any difficulty in finding out which doctor has been attending a patient who is a party to a lawsuit, whereas it would usually be impossible to discover to which priest any particular confession has been made, nor could it be known whether the person whose confession was required for evidence had confessed the action or conduct with which the trial was concerned.

If the required doctor were as little discoverable as the required priest, and if his evidence were confined to relating the verbal confidences that he had received from his patient, he would be as little troubled by subpoenas as is the priest.—I am, etc.,

Wakes Colne, Essex, Aug. 21st. R. M. COURTAULD.

TONSILS AND RHEUMATISM.

SIR,—The real problem of prevention of rheumatism is, as has been clearly shown in the recent reports of commissions, one rather of social hygiene than of strictly medical practice. That, however, does not justify any slackening in our medical study of the disease and its prevention, and Dr. Parker's letter (BRITISH MEDICAL JOURNAL, August 27th, p. 366) seems to me to smack just a little of *laissez faire*. Whatever one's views may be as to the exact relation between tonsillitis and rheumatism, there can be little doubt as to the closeness and importance of the relation, and it follows that the most crucial part of the prevention of rheumatism from the medical point of view is the prevention of tonsillitis. To preserve a healthy nasopharynx should be the ideal, attainment of which would help to prevent a whole host of diseases besides rheumatism. The attainment is admittedly not easy, and demands a much more serious view of the common respiratory affections of infancy than is usually taken. The ordinary "nasal discharge"—which is often regarded with complacency even by medical men—if allowed to persist lays the foundation for chronic lymphatic enlargement in the nasopharynx, with all its train of evils. Infant welfare activities should do much to improve matters in this respect. Cod-liver oil both in prophylaxis and treatment is of great value, and seems preferable to the iodine mixture suggested by Dr. Parker, since it not only contains plenty of iodine but also, through its vitamin content, exercises a favourable influence on calcium metabolism. Ultra-violet light will often rapidly clear up nasal catarrh in an infant.

When the tonsils and adenoid tissues are already enlarged and unhealthy, the problem is one of practical politics. Social conditions must be taken into account as well as purely medical. Tonsillectomy, like many another surgical procedure, is a reproach to the physician but, like them, is often also the wisest course to adopt. It is clear that to restore the damaged tissue to health and function is the most desirable end and, given good hygienic circumstances, this may, no doubt, be not infrequently attained, as Dr. Parker maintains. Unfortunately, it is just in the "rheumatic" classes that it is most difficult to attain. In my work in the nose and throat department of the Aberdeen Dispensary I make a practice of attempting conservative treatment whenever there seems to be some prospect of success. In the great majority of these cases one is forced eventually to resort to tonsillectomy. What has to be borne in mind when considering the treatment of enlarged and inflamed tonsils is that they either are already or may easily become the permanent habitation of colonies of specific or non-specific bacteria, thus composing the prologue to many tragedies of disease. Only when there seems to be a fairly good prospect of restoring the glands to health and function is one justified in persisting for any length of time with conservative treatment.—I am, etc.,

Aberdeen, Aug. 30th. E. R. C. WALKER, M.B., Ch.B.

SIR,—In my letter in your issue of August 27th (p. 366) I inadvertently cited Sir George Newman as having stated that "enlarged or inflamed tonsils are a cause (or the cause?) of rheumatism in children."

I am afraid I made the mistake—all too common—of quoting without verifying from the source the exactness or otherwise of the words ascribed, with the result that I find I have credited Sir George Newman with a view which he has never, in fact, expressed. I much regret this error and offer Sir George and yourself my sincere apology.

I may add that, with the exception of the first paragraph, my letter expresses my opinion on the subject under correspondence.—I am, etc.,

Flackwell Heath, Bucks, Aug. 30th. G. D. PARKER.

AN OPERATING THEATRE OUTFIT.

SIR,—The timely letter of Sir John O'Conor in the JOURNAL of August 27th (p. 365) opens up a question which, I submit, urgently requires to be thoroughly discussed and finally settled. Do surgeons and nurses need to envelop themselves in caps, masks, rubber gloves, and "boots, gum, leg," or will the use of soap and hot water, a scrubber, and antiseptics for the hands and forearms, with cleanliness of dress, (short) hair, mouth, teeth, and throat, be sufficient? I have been through the periods of (1) the Listerian ritual, (2) antiseptics, (3) asepsis as practised to-day, and submit that the right method is a combination of (2) and (3).

We do not need to render the patient poisoned and exhausted by a superheated theatre or by exclusion of fresh air (so-called avoidance of chill) or make ourselves uncomfortable by wrapping up as described above or by absorbing vitiated and heated air, laden with the vapour of anaesthetics. I was assistant at the South Devon and East Cornwall Hospital for many years to the late Connell Whipple, a well known Plymouth surgeon. A clean, rapid, and decided operator, he never took to rubber gloves (while I knew him), but wore a sterile overall and carefully prepared his hands and forearms with plenty of hot water and soap, thorough scrubbing, and prolonged soaking in a solution of mercury biniodide in alcohol. I do not remember that he got more sepsis in his work than any of the surgeons who followed "aseptic" methods. I have been an ardent advocate of rubber gloves, but now, except for septic cases, have discarded them. From age and force of circumstances I perform no major operations at present, but I do all the minor surgery that comes my way with cleanliness and strict attention to antiseptic detail. In the only case of mine which became infected, two years ago, I made use of rubber gloves.—I am, etc.,

H. W. WEBBER, M.S., M.D.LOND.

West Looe, Cornwall, Aug. 31st.

CONVULSIONS OCCURRING DURING SURGICAL ANAESTHESIA.

SIR,—I do not think Dr. Pinson (May 28th, p. 956) has to look far for the cause of his trouble; it was in the too large doses of atropine that he has been employing in conjunction with ether anaesthesia. The ether was in no way to blame. The majority of medical men fail to realize that the same dose of a drug cannot be given to a patient when under an anaesthetic as can be employed with possible safety in a patient who is not under that influence; it depends upon the anaesthetic used. In other words, Dr. Pinson might have given, say, 1/60 grain atropine to a patient and used chloroform as his anaesthetic and not had a death, whereas with the same patient if he had used ether he would have had convulsions and possible death.

During my thirty years as an anaesthetist and as a teacher of anaesthetics I have spent some years working out the correct dose of morphine and atropine to be given to any patient prior to operation. The correct dose—that is, from the point of view of absolute safety, and also, I have no hesitation in saying, the routine and maximum dose for any patient over 12 years of age, should not exceed 1/8 grain morphine and 1/150 grain atropine. Between the ages of 5 and 12 years the dose should be 1/12 grain morphine and 1/200 grain atropine. These doses mean *safety* and are ample for all patients, male or female. The symptoms of atropine poisoning are: "Convulsions followed by paralysis, stupor at times alternating with delirium, coma, and death preceded by heart failure and failure of respiration. Death is due to asphyxia."—I am, etc.,

Melbourne, July 6th. R. W. HORNABROOK.

SIR,—I was much interested in Dr. K. B. Pinson's article (May 28th, 1927, p. 956) dealing with cases of convulsions occurring during surgical anaesthesia. I notice that all the cases reported by him happened when ether was used as the anaesthetic. In 1919, when I was working at the Civil Hospital, Basrah, I had a similar experience, but in this instance chloroform was the anaesthetic employed. The patient was an Arab woman and the operation curettage. The anaesthetic was pure chloroform (as ether or mixtures were found to be too volatile in the high temperatures prevailing), and was administered by an Indian subassistant surgeon. The patient went under quite well but, just as I was about to begin, she had a typical epileptiform fit. There was no obstruction to the breathing and no change of colour. The anaesthetic was continued, and after a few minutes the convulsions ceased, and I was able to complete the operation. There were no further convulsions. I could obtain no history of previous fits.

The case completely puzzled me, seeing that chloroform is so frequently used to control convulsions. Evidently, as Dr. Pinson remarks, the anaesthetic agent is not the cause, and his suggestion of an excess of CO_2 seems to be the only explanation.—I am, etc.,

Pukekohe, New Zealand, July 27th. L. J. FORMAN BULL.

A FORGOTTEN BENEFACTOR.

SIR,—It is about a great medical pioneer, and about his forgotten and neglected grave, that I venture to appeal for the sympathy and support of your readers.

On January 27th, 1800, was born at Lady Halton, in the parish of Bromfield, a picturesque village two miles west of Ludlow in Shropshire, a boy to whom the name was given of Henry Hill Hickman. Thirty years later, on April 2nd, 1830, he died—of a broken heart, it is said—and his body was laid to rest near the graves of his grandparents in the churchyard of Bromfield. Henry Hickman's name is now only just decipherable, and the stone and grave alike bear a sadly neglected appearance. He may well have died of a broken heart, for that is a common fate of pioneers, and a pioneer he undoubtedly was. Though unrecognized in his own day, he was the real first discoverer of one of the greatest boons ever conferred on suffering humanity—the anaesthetic relief of pain. It was probably in his student days, or whilst, as the custom of medical students then was, he was serving his time as an apothecary's apprentice,

that Hickman began to feel his way experimentally towards the scientific use of anaesthesia. The principle of his method was to induce unconsciousness by inhalation. The vapour he used was probably carbonic acid gas (CO_2), unmedicated. His method was no doubt crude, and probably dangerous also, inasmuch as he proposed to deprive the patient of air and partly to asphyxiate him. Nevertheless, Hickman's was the pioneer work in this great discovery. He took the diploma of M.R.C.S. and began his career as a country practitioner.

It must have been some twenty years before ether was introduced into England from America, in 1846, and still longer before Simpson in Edinburgh, three years later, discovered chloroform, that Hickman was trying in vain to get his anaesthetic discoveries recognized by the medical profession. In London he could get no hearing. In Paris they gave him a warmer reception, and many encouraging words. He even secured the honour of an introduction to the French King, Charles X, but neither in France nor in his own country could this young surgeon get any practical move on in the way of specialized experimental research. Having by this time a wife and children he had to revert to the ordinary ways of earning his livelihood. For a while he practised in Shifnal, in Ludlow, his native district, and in Tenbury. At the latter place he lived at No. 18, Teme Street. A notice card is still extant to say that on every Tuesday (the market day in that town) he was willing to see gratis, between certain hours, the poorer people of the neighbourhood. Was this kind yet eager heart already beginning to break? Anyhow, at the early age of 30 he died at Tenbury, leaving a widow and four children.

At the beginning of the present century Hickman's name was partly recovered from obscurity by one or two of the leading medical journals, and some little honour was done to his memory. Mr. C. J. S. Thompson, a chemical authority, wrote a long and interesting article on Hickman's short and tragic career in the BRITISH MEDICAL JOURNAL, April 13th, 1912 (p. 843). It was illustrated by Hickman's portrait—a very pleasing one, in the possession of his granddaughter—from a copy in the Wellcome Historical Medical Museum, 54A, Wigmore Street. All this took place just before the outbreak of the great war. That catastrophe overshadowed, of course, greater events than the revival of any one individual memory. Now that we are coming back to more normal times, and now that we are nearing the centenary of Hickman's death, is it not reasonable to hope that those who represent the English medical faculty will do something to recognize the debt which we all owe to one of our greatest medical pioneers? The least that might be done is that his dilapidated gravestone should be restored, with some suitable inscription perpetuating his name, and expressing the honour long overdue to a great human benefactor, one withal English born and English bred.—I am, etc.,

F. WAYLAND JOYCE,
Formerly Vicar of Harrow and Prebendary of St. Paul's.

Petersham, Aug. 20th.

ULTRA-VIOLET RADIATION AND VARICOSE ULCERS.

SIR,—In the discussion on the uses and limitations of ultra-violet radiation in the Section of Dermatology at the Annual Meeting of the British Medical Association, Dr. F. Gardiner is reported to have stated, "It was useless for varicose and chronic ulcers" (BRITISH MEDICAL JOURNAL, August 13th, p. 257). This statement, in the present stage of the development of actinotherapy, is unduly dogmatic and, coming from an authority who has obtained good results with ultra-violet treatment in such difficult conditions as lupus erythematosus and sycosis, carries too much weight.

It will be observed that Dr. Dore, who read the opening paper in an admittedly pessimistic vein, stated that chronic septic and tuberculous ulcers are benefited by light. It is assumed that he included varicose ulcers in this chronic septic type.

These two opinions, coming from accepted authorities, would have been irreconcilable if Dr. Gardiner himself had not given the explanation by saying, "The accurate and scientific dosage and the limitations of the new therapy could not yet be stated." Throughout the discussion and, it may be added, throughout the literature on ultra-violet treatment, these diametrically opposed views are continually met with. The reason, of course, is that there is no standard technique, and unless the technique is mentioned there is no common ground for discussion. Ultra-violet treatment may mean a few minutes with a carbon arc at three or four feet, or double the time with a Kromayer in contact.

I have not found ultra-violet radiation useless in the treatment of varicose and chronic ulcers but, on the contrary, very valuable. Varicose and other ulcers which had remained unhealed for many years, in spite of every form of treatment, immediately began to improve, and steadily healed with ultra-violet radiation.—I am, etc.,

M. WEINBREN.

London, W.1, Aug. 18th.

BLOOD PRESSURE.

SIR,—Many members of the medical profession will feel grateful to Dr. Adam Moss for his letter on blood pressure which appeared in your issue of August 20th (p. 328). In it he states what must have passed through the minds of many of us. What he objects to is, unfortunately, only one of several practices which, under the name of medical or surgical advances, are used without due regard to the real advantage of the patient.—I am, etc.,

JOHN CAMPBELL, M.D.
F.R.C.S.Eng.

Craigavad, Co. Down, Aug. 30th.

Medico-Legal.

ACTION TO RECOVER MEDICAL FEES.

OUR special correspondent in Capetown sends the following note:

A decision of much interest to the medical profession in general, and to specialists in particular, was given in the magistrate's court, Wynberg, on July 5th, by Mr. D. D. Leslie, A.R.M., in the action brought by Mr. C. E. Jones-Phillipson, F.R.C.S.Ed., of Capetown, against Otto Thiel. The plaintiff, who practises as an ear, nose, and throat specialist, sued the defendant for the sum of twelve guineas, being professional fees for services rendered to the latter's daughter. Defendant denied responsibility, claiming that he was not in law liable for the fees—his daughter being a minor—and that, in any case, they were excessive and unreasonable. He conducted his own defence. According to the evidence of plaintiff, Miss Thiel consulted him one afternoon, complaining of great pain in the ear. The trouble was diagnosed as inflammation of the middle ear. He applied immediate treatment for alleviation of the pain, and sent her home with instructions to report to him on the following day. After her departure, in accordance with a well established custom in the profession, he communicated with the girl's mother on the telephone and explained the position, giving at the same time instructions as to further treatment. Mr. Thiel was not at home at the time, and plaintiff did not speak to him about the case. Miss Thiel attended at his consulting rooms six times in all. His fees for the consultations and treatment amounted to twelve guineas, an account for which was rendered in due course. Evidence for the plaintiff was given by Dr. W. Darley Hartley, President of the Medical Council, who asserted that the procedure adopted by Mr. Jones-Phillipson in communicating with the mother of the patient, who was a minor, was correct. It was not usual, he declared, to discuss the question of fees beforehand, and the fees charged, in his opinion, were most reasonable. Evidence testifying to the correctness of the treatment advised and to plaintiff's observance of medical etiquette was given by Mr. H. A. Moffat, F.R.C.S., and Mr. F. F. Petersen, F.R.C.S.Ed. Called by her father, Miss Thiel stated that she had been troubled by earache, and had been advised to consult Mr. Jones-Phillipson. She was not aware of the fact that he was a specialist when she went to him, and her father knew nothing about the visits until later. Cross-examined, she admitted that her trouble was relieved as the result of the treatment received. After hearing counsel in argument, the magistrate granted judgement for plaintiff, with costs. He found that the treatment had been necessary, that all visits had been essential, and that the ear trouble was such as reasonably to require the services of a specialist. He was, furthermore, of opinion that Mr. Jones-Phillipson had acted in accordance with professional custom in communicating with the girl's mother, and that the fee charged was, for a specialist, in no way excessive. The only other question was whether, in the circumstances, the father of the minor was in law liable to pay, which question had to be answered in the affirmative.

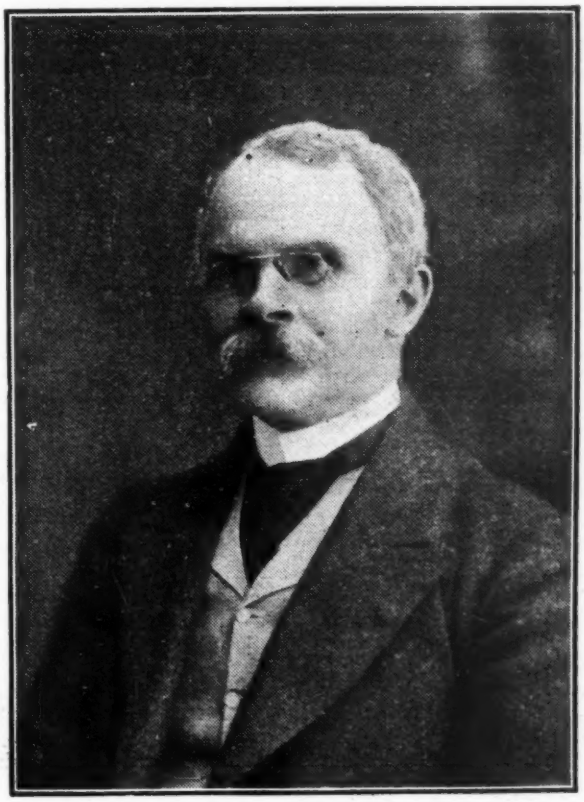
Obituary.

ALBAN HENRY GRIFFITHS DORAN, F.R.C.S.Eng.,

Consulting Surgeon to the Samaritan Free Hospital, London.

In an annotation in our issue of August 20th we regretfully stated that Mr. Alban Doran had been admitted to the ophthalmic ward in St. Bartholomew's Hospital, suffering from acute glaucoma; notwithstanding all that the loving care of the staff of his old hospital could do for him he died on August 23rd.

In the London medical world he was once a familiar figure, which, however, had not often been seen lately, as advancing years and failing sight restricted his activities; twenty or thirty years ago Alban Doran's personality, his anatomical and gynaecological erudition, and certain harmless eccentricities of movement and expression marked him out for notice at those meetings of medical societies which he long frequented, where his small but active figure and his alert carriage never failed to attract attention.



Alban Doran.

He was brought up in a literary atmosphere, for his father, Dr. (of Philosophy) John Doran, F.S.A., was editor of the *Athenaeum* and of *Notes and Queries*, and was the well known author of various works on the stage and historical subjects.

Alban Henry Griffiths Doran was born in London in 1849, and received his preliminary education at a private school. He entered the medical school of St. Bartholomew's Hospital in 1867, and distinguished himself by winning scholarships and prizes. After holding the offices of house-physician to Dr. Reginald Southey and house-surgeon to Mr. Luther Holden, he was appointed an assistant demonstrator of anatomy in the medical school, but gave up teaching after a year's experience. He obtained the diplomas of M.R.C.S. and L.S.A. in 1871, and that of F.R.C.S. in 1875. Doran was a skilled and delicate dissector, and in 1873 he became anatomical assistant to Sir William Flower at the Royal College of Surgeons of England, thus beginning a connexion with its museum which lasted almost to the end of his life. Soon after this appointment Flower fell ill, and in his absence Doran undertook the secretarial work of the conservator, which brought him into relationship with many eminent men of science, such as Richard Owen, Huxley, St. George Mivart, Garrod, Slater (who investigated the remains of an almost wingless bird from Rodrigues Island), Fayrer, Virchow, and others. On the return of Sir William Flower, Doran helped him in his work of craniometry.

Doran's attention was drawn to the middle ear in mammals, and he took up the subject enthusiastically, exploring the large stores of mammalian skulls in the museum and finding a great number of auditory ossicula, which he mounted on glass. It only then came to his knowledge that Professor Hyrtl had written a monograph on the subject, based on a considerable number of specimens. At that time the College received very frequently the bodies of animals which had died in the Zoological Gardens, and these furnished him with additional materials. With the help of Mr. Ockenden, for many years an assistant in the Gardens, he dissected out the auditory ossicles of an elephant. The collection of ossicula thus acquired was displayed, as they may still be seen, in wide shallow boxes. To these was added Max Hübrich's collection, showing the anatomy of the bones of the inner ear in mammals, which was remounted by Mr. Doran. The ossicula auditus were exhibited at a meeting of the Royal Society, and a little later a monograph on the subject was published, with engravings by Bergeau, in the *Transactions* of the Linnean Society (1878).

But Alban Doran's industry and intelligence were not exclusively devoted to anatomy. He held the appointment for some years of pathological assistant at the College of Surgeons, and for eight years he laboured with Sir James Paget and Sir James Goodhart in the compilation of a catalogue of the pathological specimens in the museum. In 1877 he was elected an assistant surgeon to the Samaritan Free Hospital for Women, where he had Sir Spencer Wells, Dr. Bantock, and Mr. Knowsley Thornton for colleagues, and took part in that development of gynaecology with which their names and his own will always be associated. For eight years he assisted Paget in the arrangement of the surgical series of the pathological collection at the College of Surgeons, and his special knowledge was of great value in the rearrangement and description of the specimens illustrating disease and injury of the female genito-urinary tract, many of which were obtained from the Samaritan Hospital. Doran worked for thirty-three years at this hospital, his surgical operative work being largely concerned with supracervical hysterectomy for fibroids and with certain abdominal tumours, mainly retroperitoneal; their pathology and the operative results he brought before various societies and published in this JOURNAL.

When he retired from private practice in 1909 Doran returned as a volunteer worker to the museum of the College of Surgeons, where Sir Arthur Keith afforded him facilities for work in any field that he preferred. The obstetrical and gynaecological series were then rearranged with the valuable help of Professor Shattock, and he obtained the aid of Dr. Barris of St. Bartholomew's Hospital in mounting a small but instructive group of normal and deformed pelves.

Doran had become President of the Obstetrical Society in 1899, and when that society was absorbed by the Royal Society of Medicine he used his influence to promote the transfer of its museum as a loan collection to the College of Surgeons, and from 1912 onwards his energies were largely devoted to the compilation of a descriptive catalogue of the obstetrical and other instruments in the museum, to which Sir Rickman Godlee added the appliances and instruments used by Lister in his physiological and pathological researches and in the evolution of antiseptic surgery. Doran completed the descriptive catalogue of the entire collection before the end of 1925, after thirteen years' work. It has been typed and many of the volumes printed, and it forms a monument *aere perennius*, almost if not quite unique, of his industry and knowledge. We understand that the catalogue is being kept up to date by Mr. C. S. Thompson, lately of the Wellcome Historical Medical Museum, who had helped Mr. Doran freely during its compilation.

Doran joined the salaried staff of the BRITISH MEDICAL JOURNAL as sub-editor in the early eighties, when Mr. Ernest Hart was the editor, and Dr. Alexander Henry, who had long been secretary of the Metropolitan Counties Branch, was assistant editor; the other sub-editors were Dr. Fancourt Barnes, son of the more famous Dr. Robert Barnes, and Mr. George Eastes, F.R.C.S., who had been honorary secretary, and afterwards treasurer, of the Metropolitan Counties Branch, and subsequently an active member of the central Council. The salaries were small and the duties light, but Doran would spend the whole of publishing day with Dr. Henry. He could always be depended upon to get up his facts carefully, had a command of several languages, and wrote a good English style. But journalism did not appeal to him, and he presently found more congenial occupation at the Royal College of Surgeons, as has already been related.

Alban Doran's was not a narrow mind. Notwithstanding his anatomical, pathological, and surgical activities, he found time to acquire much curious learning and a wide knowledge of literature. He was an accomplished Shakespearean scholar, and contributed the article on "medicine" to *Shakespeare's England*. Those who had the good fortune to hear his annual oration as President of the Medical Society of London in 1899 on "Shakespeare and the Medical Society" will remember with what an almost overpowering wealth of quotation it was illustrated. His article in the *Journal of Obstetrics of the British Empire* on "Burton (Dr. Slop), his forceps and his foes," in which he wrote of Dr. Burton of York and Sterne's caricature of him, displayed not only his erudition but also his sense of humour. He was an honorary fellow of several foreign societies, and besides the works above named he published a *Handbook of Gynaecological Operations* in 1887.

[The photograph reproduced is by Mr. Adolphus Tear, London and Ipswich.]

ARTHUR DRURY, M.B., C.M.,

Late President of the Association of Public Vaccinators.

DR. ARTHUR DRURY, who died on August 22nd, at his residence in Halifax, at the age of 66, received his medical education at Edinburgh, where he graduated M.B., C.M. in 1887. He then commenced practice in Halifax and held the appointments of medical officer to the Halifax Union and public vaccinator to the borough.

Dr. Drury will chiefly be remembered for his strenuous support of vaccination; he was honorary secretary of the Jenner Society, and for a time he edited a supplement of the *Medical Officers' Journal* on this subject. He was at one time president of the Association of Public Vaccinators of England and Wales, and he was the author of an article on vaccination published in the *Journal of the Royal Sanitary Institute*. During the war he served as registrar of St. Luke's War Hospital, Halifax, with the rank of Major R.A.M.C.

Dr. Drury was assistant secretary of the Yorkshire Branch of the British Medical Association from 1890 to 1900, and a member of the Branch Council from 1909 to 1914. He was a representative of the Halifax Division from 1908 to 1916, and chairman in 1914. He was also a member of the Vaccination Subcommittee of the Public Health Committee from 1912 to 1913.

We are indebted to two of Dr. Drury's colleagues for the following personal appreciations.

Dr. A. E. COPE writes: The news of the death of Dr. Arthur Drury will come with the shock of painful surprise to many who never had the privilege of his acquaintance. Right away from the time when, in May, 1893, as public vaccinator for Halifax, he gave evidence before the Royal Commission on vaccination, his name has been closely linked with the cause he there advocated. The formation of the Association of Public Vaccinators of England and Wales naturally attracted him, and he was one of the early members, being elected to the council in 1903, and serving as president from 1907 to 1909. He threw himself most actively into the association's work, rarely missing a council meeting, and his keen insight, abounding energy, and journalistic instinct deeply influenced its policy and extended its influence. On the death of Dr. Bond of Gloucester he took over for a time the secretaryship of the Jenner Society, and held himself ready to enter the lists against any of the opponents of vaccination, whether with voice or pen. For many years he edited the supplement to the *Medical Officer*, devoted to the interests of the Association of Public Vaccinators, while more recently he added to his labours the editing of a similar supplement on behalf of the Poor Law Medical Officers' Association. Both associations will find it difficult to fill his place.

He was a keen controversialist, but never harboured a grudge, and his uncompromising honesty and singleness of aim won him friends even among his opponents. Although his health had been a source of anxiety for some time his tireless enthusiasm and indomitable courage kept him at work right to the end. He gave evidence quite recently before the Vaccination Committee appointed by Mr. Neville Chamberlain, and in July he took part in the discussion on small-pox at the Hastings meeting of the Royal Sanitary Institute. We lose a most loyal comrade and friend, and the public health service a strenuous and unselfish advocate.

Dr. JAMES BENNETT writes: As ex-president of the Public Vaccinators Association I feel I must write a short appreciation of my old and sincere friend, the late Dr Arthur Drury of Halifax. Dr. Drury was a man of magnetic personality, of the most transparent sincerity, and these, accompanied by such an extraordinary gift of expression, both by word and by pen, made him a truly outstanding figure in the great profession to which he belonged. How he spent his strength for others is well known to his medical colleagues, and in spite of physical suffering, which for several years necessitated his taking a long holiday in the South of France during the winter months, his temperament was such that he could not find peace of mind unless he was working at a rate impossible to most of us, and he died in harness, which was his wish. A brilliant debater and an incisive writer, he has rendered unmeasurable service to the community as a whole by his advocacy of vaccination for small-pox. Those of us in closest touch with the Public Vaccinators Association are only too conscious of the great loss we have sustained. Capable of almost superhuman effort and accomplishment, and giving unstintingly of his brilliant qualities, his place can never be adequately filled by one person. Notwithstanding that his sight had all but failed him, and his strength had ebbed, he was as cheery as ever and arranged to attend the congress of the Royal Sanitary Institute at Hastings, to support the case for vaccination. Few men possessed such a knowledge of the history of small-pox, combined with statistics relative to the efficacy of vaccination. It is therefore little wonder that when legislative changes were contemplated his experience was so frequently drawn upon. His was a case of "the busy man always finding time," for not only had he built up a large private practice, but the causes of Poor Law and national health insurance always found in him an able exponent and a faithful practitioner.

DR. SAMUEL WILLIAMS, who died at his residence in Llanelly on August 19th, aged 60, received his medical education at Cardiff and University College Hospital. He obtained the diplomas M.R.C.S.Eng., L.R.C.P.Lond. in 1891, graduated M.B.Lond. in 1893, and proceeded M.D. two years later. He held the appointments of house-physician and obstetric assistant at University College Hospital, and was later senior medical officer at the City Fever Hospital, Birmingham. For some time subsequently he travelled abroad and then commenced at Llanelly an eminently successful practice, taking a prominent part in the medical affairs of the district. He was a member of the Executive Committee of the South-West Wales Division of the British Medical Association from 1907 to 1913 and from 1922 to 1925. He was a member of the South Wales and Monmouthshire Branch Council in 1914 and chairman of the South Wales Division in 1916. He was also secretary of the Panel Committee; a certifying surgeon under the Factory Act; a medical referee under the Workmen's Compensation Act; and during

the absence of the medical officer of health for Llanelly on war service he acted in his stead. A colleague writes: Dr. Williams was a man of engaging personality; he was a tactful negotiator in all the meetings of doctors and workmen, a post which he occupied almost as a matter of course. Moderate and wise in counsel, he expressed in his life the lessons of philosophy, to which study he was much attracted. Something of the spirit of Zeno enabled him to bear a long and trying illness with most exemplary fortitude. His funeral on August 22nd, one of the largest ever seen in Llanelly, was a spontaneous demonstration of the esteem and affection with which he was regarded. In the hearts of the throng that followed him to his grave was an unuttered epitaph: He was a great friend.

Dr. JAMES MITCHELL, who died at his residence in Walton, Liverpool, on August 16th, aged 69, received his medical education at Queen's College, Belfast, Liverpool, and Dublin, and graduated M.D. of the Royal University of Ireland in 1883, obtaining the L.M.R.C.P.I. in the same year. After holding various assistantships and the post of resident surgeon at the South Dispensary, Liverpool, he settled in North Liverpool and carried on a large general practice for forty-one years, winning affection and respect from his colleagues and patients. He was a member of the British Medical Association. He leaves a widow, one son, and three daughters.

Dr. ARTHUR JOHNSON GEDGE, who died suddenly on August 16th, received his medical education at the London Hospital, and obtained the diplomas M.R.C.S.Eng. and L.S.A. in 1886 and the L.R.C.P.Lond. in 1888. He was formerly house-surgeon and house-physician at the London Hospital, and house-surgeon to the Eccles Patricroft Hospital. He acted for some time as surgeon in one of the hospital ships of the Mission to Deep Sea Fishermen.

Universities and Colleges.

UNIVERSITY OF CAPETOWN.

Graduation Ceremony.

AT the July graduation ceremony of the University of Capetown the following were admitted to the degree of Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.):

Ethel M. Brooms, L. M. Cohen, M. A. Helm, J. J. Jacobson, J. W. van Eeden, J. Wakeford, E. H. Walker.

Medical News.

THE Association of Special Libraries and Information Bureaux will hold its fourth congress in Cambridge at the end of September. The members attending will be received at Trinity College by Sir J. J. Thomson, O.M., the Master, on the evening of September 23rd. This will be followed by a dinner at which Sir Geoffrey Butler, K.B.E., M.P. for the university and president of the conference, will give an address. The subjects to be considered on the following days include the recent report of the Public Libraries Committee of the Board of Education, co-operation between libraries, and the selection of books in science and technology, on which a discussion will be opened by Sir Richard Gregory, editor of *Nature*. The question whether a co-operative catalogue of reference libraries in London is a practical proposal will also be considered. Further information can be obtained from the Secretary of the Bureaux, 38, Bloomsbury Square, London, W.C.1.

THE fortieth annual conference of the Sanitary Inspectors Association is being held this week at Plymouth, under the presidency of Professor Leonard Hill, M.B., F.R.S., who delivered his address to the Association on Wednesday morning.

THE Fellowship of Medicine and Post-graduate Medical Association announces that on September 19th the Westminster Hospital will start a fortnight's whole-day course in medicine, surgery, and the specialties, fee £3 3s. On the same date the Royal National Orthopaedic Hospital will start a two weeks' course, fee £2 2s. During October courses will be given in ante-natal work at the Royal Free Hospital (limited to 10) on Fridays, at 5 p.m., fee £1 1s.; cardiology at the National Hospital for Diseases of the Heart (limited to 20), fee £7 7s.; diseases of children at the Victoria Hospital and Paddington Green Hospitals, fee £3 3s.; diseases of the throat, nose, and ear at the Central London Throat, Nose, and Ear Hospital, fee £5 5s. for clinical course and £7 7s. for operative class; electrotherapy at the Royal Free Hopsital on Wednesdays at 5.15 p.m., fee £1 1s.; gynaecology at the Chelsea Hospital for Women, fee £5 5s.; tropical medicine at the London School of Hygiene and Tropical Medicine, on Tuesdays and Thursdays, at 2 p.m., fee £2 2s.; and neurology at the National Hospital, Queen Square, for two months. In October also will begin a series of lectures arranged by the Fellowship on "Practical hints in medicine, surgery, and the allied specialties," opened by Sir Humphry Rolleston, Bt., on Monday, October 17th, at 5 p.m. There will also be weekly clinical demonstrations in medicine, in surgery, and in ophthalmology. These and the lectures are open to all members of the medical profession without fee. Copies of syllabuses, of the general course programme, etc., are obtainable from the Secretary, Fellowship of Medicine, 1, Wimpole Street, W.1, and the names of those who wish for them will be entered on the mailing list to receive copies as and when published.

COMMENCING on October 4th, a practical post-graduate course in the surgery of the gastro-intestinal tract will be held at the Salpêtrière Hospital, Paris, and will continue for one week. Further information will be found in our advertisement columns.

A POST-GRADUATE course in pediatrics will be given in Paris by Drs. P. F. Armand Delille and B. Weill-Hallé at the École de Puériculture of the Faculty of Medicine in Paris, 64, Rue Desnouettes. Further information may be obtained from the secretary of the Association for the Development of Medical Relations between France and Allied Countries, 12, Rue de l'École de Médecine, Paris VI^e^.

A COURSE in practical cardiology will be held at the Hôpital Broussais, 96, Rue Didot, Paris, from October 10th to 27th, under the direction of Dr. C. Laubry. The fee is 200 francs.

THE annual dinner of the Chelsea Clinical Society will be held at the Café Royal, London, on Tuesday, October 25th, at 7.30 p.m.

THE Court of Assistants of the Society of Apothecaries of London has adopted the report of the Examinations Committee recommending the institution of a diploma indicating specialized knowledge of the subjects of ante-natal care, midwifery, and infant welfare, and steps are being taken to institute the examinations at an early date. The examinations will be open to registered medical practitioners, and further particulars will be published later.

DR. JAMES WHEATLEY, county medical officer of health for Shropshire, has been elected president of the Society of Medical Officers of Health for the session 1927–28, and will deliver his presidential address at the house of the society on Friday, October 21st, at 5 p.m. The annual dinner of the society will be held at the Piccadilly Hotel, W., on Thursday, November 17th, when the Minister of Health and the President of the Board of Education will be the principal guests.

THE Neech Prize for the best paper read during each year before a branch or group of the Society of Medical Officers of Health has been awarded for last session to Dr. E. H. R. Harries, medical superintendent of the Birmingham City Hospitals, whose subject was "The serum treatment of scarlet fever."

A MEMORIAL tablet has recently been unveiled in the naval hospital of St. Anne at Toulon in honour of Dr. Louis Tribondeau, an eminent clinician and bacteriologist, who has given his name to a well known stain. He died of influenza at Corfu in 1918.

THE Lister Centenary Exhibition at the Wellcome Historical Medical Museum, 54A, Wigmore Street, will be closed on October 1st. Since its opening in April it has been inspected by a large number of visitors from all parts of the world.

OUR Capetown correspondent reports that the annual competition for the Jones-Phillipson Golf Trophy, open to members of the Cape Western Branch of the Medical Association of South Africa (British Medical Association), took place on August 3rd, on the course of the Royal Cape Golf Club at Wynberg. The winner—a most popular winner—proved to be Dr. E. L. Steyn, who returned a net score of 79, which is bogey for the course. Dr. Steyn, who recently retired from active practice on account of indifferent health, won the South African Amateur Golf Championship in 1910, but has had little opportunity for serious participation in the game during the last few years. He is to be congratulated on his well deserved success.

Letters, Notes, and Answers.

All communications in regard to editorial business should be addressed to ***The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.***

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the BRITISH MEDICAL JOURNAL alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the BRITISH MEDICAL JOURNAL must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the JOURNAL, should be addressed to the Financial Secretary and Business Manager.

The ***TELEPHONE NUMBERS*** of the British Medical Association and the BRITISH MEDICAL JOURNAL are *MUSEUM 9861, 9862, 9863,* and *9864* (internal exchange, four lines).

The ***TELEGRAPHIC ADDRESSES*** are:

EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology Westcent, London.*

FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*

MEDICAL SECRETARY, *Mediocra Westcent, London.*

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 4737 Dublin), and of the Scottish Office, 6, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 4361 Central).

QUERIES AND ANSWERS.

DIAPHORETICS AND DIURETICS.

"SCRUTATOR" finds that many diaphoretic and diuretic mixtures are unpalatable. He asks for suggestions as to mixtures which are at once palatable, effective, and reasonable in cost.

HYPERIDROSIS.

DR. C. J. E. COCK (Blackheath) writes in reply to "Tropicus" (JOURNAL, August 27th, p. 372): I would suggest he tries an ointment containing 2 per cent. of formaldehyde in lard, without previous bathing by the patient. This is rubbed once a day into the feet and hands on two—or, in extreme cases, on three or four—successive days, after which the hyperidrosis ceases and the sweat is brought back to normal. The effect lasts from four to six weeks, when the treatment may be repeated, if necessary.

OMENTAL TEARS.

DR. JOHN M. MUNRO (Odessa, Ontario) writes in reply to "M.B., Ch.B." (July 23rd, p. 152): The case seems to be one of "tug on the omentum." An exploratory operation is necessary to relieve the pain, as the omentum may be caught in the tear. I had a case recently, and on operation found the omentum not only caught but herniated to such an extent that it could not be replaced in the abdomen without extension of the tear, and then a kangaroo tendon suture to close.

TREATMENT OF ONYCHIA.

DR. AGNES SAVILL (London, W.) writes in reply to "W. S. M." (JOURNAL, July 30th, p. 196): Onychia is so obstinate that every means of raising the general resistance should be employed. Fresh air, tonics, vaccines, sunlight, exercise, plenty of water, fruit, vegetables, and avoidance of sweet foods all aid the patient. Locally mild mercurial ointments may be sufficient, but ionization provides the most reliable means of dealing with the infection. A small piece of gauze or cotton-wool, soaked in a 2 per cent. solution of zinc sulphate, is carefully inserted round the base of the nail, another piece is placed over it, and a small flexible tin electrode attached to the positive pole. The negative pole is a larger pad on the anterior aspect of the forearm. A small current—1 to 5 milliamperes—is passed for five to eight minutes, according to the severity of the condition. Three or four applications, given twice a week, are usually sufficient, even in severe cases.

ANGIO-NEUROTIC OEDEMA.

"C. E. S.," who noticed the inquiry of "Ajax" (JOURNAL, August 20th, p. 331) as to the treatment of a case of angio-neurotic oedema, asks whether the administration of fresh sea-water has been tried. "C. E. S." suggests that "Ajax" might begin with doses of ʒij in water two or three times daily, half an hour before food, increasing the amount up to one-half or one pint in the twenty-four hours, if necessary. It is readily taken by infants in milk or, when they have come to appreciate its pleasant "tang," in plain water. It does not retain its energizing, soothing, and vitalizing properties for more than about a week, by which time the radio-active sun rays will have evaporated. For the tuberculous child, the weak and overworked adult, the failing aged, and in all septic cases, however severe, its action is speedy and most astonishingly effective. It is remarkable that its virtues, so widely recognized and used more than two centuries ago, should have been for so long forgotten. Even its effects in marasmus neonatorum (made known to us by the French some fifty years since)—peace in twenty-four hours, plumpness and happy activity by the end of another four or five days at the most—do not seem to be remembered.

LETTERS, NOTES, ETC.

TOXAEMIA AND MENTAL DISORDER.

DR. JOHN B. BERRY (Keighley) writes: I was asked to see a young woman with a view to her readmission to an asylum for the third time. On entering the bedroom I was impressed by the disgusting odour, which I found was due to the state of the patient's mouth. She had eyes and mouth closed, and appeared almost unconscious. I decided to treat the mouth, and, if possible, get rid of the bad smell before sending her away. I procured a 2 oz. brass syringe and, making a wash of one part of hydrogen peroxide to seven of warm water, gave the mouth and throat a good wash out; this treatment was followed up every four hours by the mother until the next day, by which time not only was the offensive smell almost gone, but the girl was taking notice and able to swallow liquid nourishment. When I visited her on the third day she was downstairs by the fireside, and it was not necessary to send her to the asylum.

RHEUMATIC INFECTION IN CHILDHOOD.

DR. A. C. F. HALFORD (Brisbane, Australia) has been induced by the leading article on the prevention and control of infection in childhood, published in our issue of April 16th last (p. 731), to send a letter, too long and discursive for publication in full, expressing his conviction that rheumatic infection can be conveyed from one person to another. The concluding part of his letter contains the following passages: "In my own practice a large proportion of cases show evidence of pre-existing disease in parent or guardian, though persistent inquiry and clinical examination has had to be resorted to to establish a positive over a negative history. Acute rheumatic affections in the child are sometimes overlooked by the medical attendant, and these cases go to swell the number of negative histories. I therefore believe that the disease, like phthisis, is conveyed from a previous case as a result of exposure to infection on innumerable occasions over the long period of childhood. It is evident that prevention depends upon a careful survey of those in whose care we find the sufferer. A proper clinical examination in every case may reveal in the parents factors which ultimately may be found of great import. All focal infections must be regarded with the same suspicion as sources of danger to others as they are now regarded as unfavourable to the host. The influence of mixed infections is baneful and must be guarded against among all in the household, and these persons should be warned that the disease itself is communicable. The power of the infection to lie latent, obscure, and practically forgotten is seen most convincingly in the recurrences in the same patient at long intervals. It is impossible, therefore, at any time, to declare a patient free from infection. Why not regard a parent with or without an incriminating history as suspect in the same manner? In both instances there are dangers to others. Why not guard against such possibilities?"

TREATMENT OF VARICOSE VEINS BY INJECTION.

DR. S. M. WELLS (London) writes with reference to Major-General T. M. Corker's inquiry, that within the last year he has treated about twenty cases in Valparaiso, all—except one of which he does not know the sequel—with very good results. He heard of no accidents in the cases of colleagues. He adds: The injection, no doubt, causes an aseptic phlebitis and a firm thrombosis in the veins. After the injections there is some redness and tenderness, which causes a little inconvenience. The injection can be given in the consulting room and the patients can go about their work as usual immediately afterwards. Varicose ulcers clear up in a comparatively short time. Those who complain of heaviness and tiredness in their legs are greatly relieved. One of my first cases, a lady, had extensive varicose veins reaching well above the knees and a very painful varicose ulcer in the usual place, about the size of a shilling. She could not afford to lie up, having a family of eight, and she dreaded the morning housework; she obtained relief after the first injection, the ulcer ceased to hurt her, and she was able to go about quite well. The ulcer healed over in a little more than a month. The veins could be felt like cords under the skin, and there was no tenderness anywhere. I usually give two to three injections at about three to four inches interval at one sitting, repeating the process in a week wherever the veins are soft; this is not the case round the site of previous injections. The average case requires about three sessions. Of my cases three had ulcers; two healed completely to my knowledge. The third had just finished treatment when I left. The ulcer was smaller and had shelving, not punched-out, edges; it was covered with healthy granulations and quite painless. All the patients were highly pleased with the method and consequent benefit, since they did not have the loss of time, discomfort, expense, and ever-present danger of a surgical operation.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 36, 37, 38, 39, 42, and 43 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 40 and 41.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *128*.